The Builder.

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The Railways of America.

WHETHER it is a perception of an increased public interest in railway working that has called forth popular publications on the subject recently, or whether the publication of these works has itself been the means of awakening public interest on the subject, it would be difficult to decide. At all events it seems to be recognised now that railways and railway working are subjects open to treatment in popular literature. Mr. Acworth's extensive and effectively written treatise on the Railways of England has been pretty speedily followed by a similar type of book on the Railways of America;* which however is not the work of one writer, but a collection into one volume of a series of chapters by various writers, each treating separately his own subject, but the whole being written as a series and in relation to one another.

Though it might be expected that this divided authorship, and the relegation of special subjects to special writers, should conduce to a more thorough and practical character in a book on so large and complicated a subject, we cannot say that the American book in the main compares favourably with its English forerunner in practical character, except in regard to the two first chapters, written by engineers, on "The Building of a Railway" and on "Feats of Railway Engineering." Even these are written in rather a sensational style, though they really give information supplemented by a number of illustrations; and much of the book is apparently written with the special desire to say startling and effective things rather than to give information on a practical subject in a practical manner.

It is just possible that in this desire to be effective the writers have done the railway system of their country some injustice, through their endeavours to give graphic accounts of hairbreadth escapes from dangers which ought not to have existed, and of tragic accidents which ought never to have happened. It is only charitable to suggest this possible allowance for the effects of literary impulsiveness. If we are to take this book *au pied de lettre*, we can only say that it gives the idea in many parts of what might be termed an organised recklessness in the making and management of railways such as would fill people with indignation in this country, and which, if it represents the plain truth, certainly serves to account for the number of bad railway accidents which we hear of from the United States.

Nothing could more decisively mark the wide distinction between the whole spirit of railway policy in England and America than the naïve admission made by Mr. Curtis Clarke in the first chapter, "There is one thing more which distinguishes the American railway from its English parent, and that is the almost uniform practice of getting the road open for traffic *in the cheapest manner and in the least possible time*, and then completing it and enlarging its capacity out of its surplus earnings, and from the credit which these earnings give it." The italics are ours. The writer makes this characteristic admission without comment, and apparently without any perception of its damaging imputation. This system has been followed everywhere, it seems, except on a few branch lines, "and on one monumental example of failure," the West Shore Railway of New York, in which an attempt was made to build a railway up to the standard of one that had been forty years in reaching its standard of excellence. "Their money gave out, and they came to grief." The most elaborate essay could hardly emphasise more the distinction between the English and American spirit of responsibility in railway-making; a distinction of which we may well be proud. It has at all events been always recognised in England that the construction of a railway is a matter of grave responsibility in regard to public safety, and that it is not a kind of construction to be turned out anyhow, in a hurry, in order to realise dividends at the expense of risk to the lives of all travelling upon it. We allow jerry-building, unhappily, to far too great an extent; but we have not yet gone so far in the evil path as to sanction jerry railroad-making. That the Americans regard this as a perfectly natural and commendable system, as one which it is even a folly to depart from, is a charge which we should hardly have ventured to have made against them; but here we have it on the authority of one of their own engineers; and the admission throws a significant light on some of the accounts of railway accidents in the States, as well as on incidents mentioned in other portions of this book. This is the bad side of a spirit in railway engineering which has also its good or at all events its interesting side. The history of the American railroad affords, it must be admitted, evidence of what may be called the adaptability of the spirit of the nation. They were not content to adopt the system as England invented it, but began early to consider railroad-making in reference to the special conditions of the country. In making railroads over immense areas of often hilly country, where there was no choice of a flatter route within the range of district to be served, it was resolved that the railway must be adapted to the country and not the country to the railway. Hence the invention of the swivelling truck or "bogie" system, by which the whole length of train was rendered as flexible as possible, so as to go round curves of short radius. Hence also the method, of which the Americans first set the example, of working railways up slopes by a series of returns and doubles, the road coiling up the hill like a snake in a long series of curves, crossing and recrossing itself at higher levels, so that one American engineer is reported to have said, "where a mule can go, I can make a locomotive go." This eccentricity of railway planning, as it appears to those who are not used to it, is in some sites, no doubt, the most practical and direct way of meeting a difficulty. But in regard to the system of a flexible train and short curves, and the boast of the American engineer that thus a costly tunnel may be avoided by doubling round a promontory for instance, on the edge of a valley, which an English train could not go round, it must be remembered that this saving is effected at the expense both of speed and safety. A comparatively straight track, with no short radius curves, means high speed with safety, besides a more direct route. It costs more to make at first, and we can easily imagine that it would not suit a country where railways seem to be regarded mainly in the light of acute financing operations, intended to bring the quickest return possible; but with a solid financial basis it means speed, safety, saving of time, and ultimate money value in proportion. So with questions of vertical irregularity of road; as Mr. Acworth very justly pointed out in his book, the adoption of a heavy

*"The Railways of America: their construction, management, development and appliances." By various writers. With an Introduction by Thomas M. Cooley, Chairman of the Interstate Commerce Commission. With more than 200 Illustrations. London: John Murray, 1890

gradient by way of shortening the route, in one instance, had proved a permanent cause of delay and of cost in haulage which more than compensated for the initial saving in the adoption of the route. And our conclusion on comparing the American system of sharp curves and steep gradients, as described here, with the English system of often heavy initial expenditure in securing comparatively straight and level roads, is that the latter has in the long run the advantage in every particular.

The change in the type of locomotive engine from that first derived from England is another example of the independent line taken in America, and with better reason. The type of locomotive which originated in England has been adopted with little variation by most of the European countries, where the conditions of railway work did not differ very materially from those of this country. The swivelling truck or bogie, first used in American engines, as observed, for the sake of flexibility on short curves, has been to a great extent adopted in English locomotives since, though the sharp curves have not been introduced, and indeed hardly could be until the whole of the rolling stock should be mounted on swivelled wheels. But other conditions combined to change the form of the locomotive in America; the use of wood fuel, which appears to require a different type of chimney (a detail, by the way, not commented on or explained in the volume); the necessity of frequent progress through snow, which produced the snow-plough in front of the engine; the running of long portions of the earlier railways through desert prairies, which no doubt established the "cow-catcher" framework in front of the engine as a kind of recognised equipment; and the frequent traversing of long routes in hilly country and with very steep "grades," which has further developed in the States the coupling of wheels to gain all the frictional grip that is possible with the weight of the engine. Thus we have the "consolidation" locomotive, with its four pairs of small driving-wheels, all connected by coupling-rods, with only one pair of small leading wheels at the extreme front of the bearing; and the "Decapod," with five pairs of small connected driving-wheels, looking as if it ran on castors; a machine contrived for climbing steep gradients. Another peculiarity of the American engine is a recent development of the body of the engine in front of the chimney and boiler, as if the boiler were extended further. This is an elongation of the smoke-box in front of the base of the chimney, to give more space for catching and detaining brands and cinders, which collect here and can be removed by taking off the front plate. We presume the fuel used has made this desirable, as no necessity for it has been found in England, as far as we are aware. All these various *differentia* combine to render the American locomotive, to European eyes, a somewhat uncanny-looking object; it is impressive in its mass and its rather uncouth outline, but has a heavy and cumbersome appearance, and has not the expression of being formed for speed which the English locomotive conveys; it has other special merits of suitability to its circumstances, but we cannot help thinking that the English model is more a work of Art, of the two.

There are it appears, one hundred and fifty thousand miles of railway laid down in the United States; and various details in the chapters on Railway Construction, as well as this rather impressive statement of mileage, impress the reader with the fact that we are in a country where things are done on a very large scale, and where no obstacles are allowed to count. But although one cannot help admiring the ingenuity with which a railway is carried in all kinds of ways through all kinds of country, we do not know that a perusal of the book is exactly calculated to give one a wish to travel much on American railways. Especially considering that ominous sentence before quoted, as to the practice of making railways as speedily and as cheaply as possible in the first instance, one cannot but feel, while looking at some of the illustrations of sections of line carried on "trestles," that is, running on the top of a series of tripods, that while it is magnificent as long as all is right, the slightest accident must have fearful results, and that if one travelled on railways carried on these kind of viaducts one would like at all events to know that they had been built with the very best materials and with the greatest care; and such knowledge as we can get seems to point rather to a considerable lightness of heart in these matters; at all events to a feeling that economy and rapidity of construction are the main ends in view. The long "trestle" on the Colorado Midland Railway, for instance, shown in one of the plates, is described as "an expedient often of the greatest service in railway construction. These trestles are built of wood, simply but strongly framed together, and are entirely effective for the transport of traffic for a number of years." That is to say, they do wonderfully well considering their temporary nature. "They must then be renewed, or what is better, be replaced by embankment, which can be gradually made by depositing the material from cars on the trestle itself." From other remarks elsewhere, it almost seems as if piling earth on the outside of a timber structure were considered sufficient to constitute it an embankment, or what appears in America to be called a "culvert." What about the centre when the timber finally decays? It seems hardly possible that this can be the meaning, yet we do not know how else to understand the remark on page 26, in connexion with temporary wooden structures, that "a structure covered with earth is much safer than an open bridge."

In the more modern American railways the art of building lofty viaducts on very light steel piers seems to have been carried to great perfection, though from the point of view of the picturesque one is almost tempted to regret the change on comparing the view of the grand timber viaduct at Portage, on the Erie Railway, with the thin spider-like construction that has taken its place. In regard to the method of finishing the light steel viaducts for the roadway Mr. Clarke says

"Build strong iron or steel bridges and viaducts with as short spans as possible and having no trusses above the track where it can possibly be helped. Cover these and all new bridges with a solid deck of rolled steel corrugated plates, coated with asphalte to prevent rusting. Place on this broken stone ballast, and bed the ties in it as in the ordinary form of road-bed.

By this means the usual shock felt in passing from the elastic embankment to the comparatively solid bridge will be done away. Has a crack formed in a wheel or axle, this shock generally developes it into a break, the car or engine is derailed, and if it strikes the truss the bridge is wrecked. The cost of this safety floor is insignificant, compared with the security resulting from it."

Security to the bridge, no doubt, but as to security to the passengers or the train no one who looks at the drawings of the type of bridge of which this remark is made would feel much reassured. The only "security" would be that the train, unless going at a very slow speed, would go over the edge, or a great part of it at all events. The tone in which cracked and broken axles are spoken of as if they were incidents to be looked for at any day is noticeable.

The deep snows to which parts of the American railway system are subjected in winter exercise a considerable influence on the construction of roads in certain positions, most remarkably illustrated in the great covered snow-sheds built over the track on the sides of declivities, to protect the train from avalanches. The train has to be run, for a long distance in places, under covered penthouse galleries of very solid construction, the roof of which continues the slope of the ground above so that the snow slides over it. In a section given of one of these we observe that there is a double track, that outside the shed being marked "summer track" and the inside "winter track." Why people who pride themselves so much on economy in railway work should go to this expense of a double track, and why the covered track will not serve the purpose at all times of the year, it is not very easy to see. Another special feature rendered necessary by the snow is the snow-plough, a great erection like the prow of a small vessel, which is shown as pushed by sheer force through the snow, with four engines in line behind it. A more scientific means of attaining the same end appears to be exhibited in the representation of a "rotary steam shovel" at work, pushed by three engines, and sending off the snow in thick flying showers on either hand of the front engine: the illustration, a sensational one enough in appearance, is reproduced from an instantaneous photograph. There is, however, no technical description or illustration of its method of working, which it would have been of some interest to have.

The system of signalling and managing the succession of trains is described in the chapter on "Railway Management." We observe that the block system is not referred to as if it were in general use; and in regard to the interlocking system of points it is said "sometimes, by very expensive and complicated apparatus, it is made mechanically impossible to open a track for the movement of a train without previously locking all openings by which another train might interfere," so that this invaluable and, as we now consider it in England, absolutely necessary system at all complicated junctions, appears still to be regarded in America rather in the light of a costly luxury. The following passage also suggests a comparison to our advantage:—

"Any train making a stop not on its schedule must immediately send out flagmen with red flags, lights, and torpedoes to protect it. This rule is a very difficult one to enforce without rigid discipline, and its neglect is the cause of the large percentage of the accidents 'that will happen.' The flagman who must go to the rear, often half a mile, at night, across trestles and in storms, must frequently be left behind, to take his chances of getting home by being picked up by a following train. There is no one to watch him, and he will often take chances, and not go back as far or as fast as he should; and if all goes well no one is ever the wiser."

We do not think *that* kind of charge could be brought against even the humbler members of the staff of any good English railway. Another detail in which the Americans seem behind the age is in the exceedingly primitive provision for the brakesmen of "freight trains," who appear simply to stand on the roofs of the carriages, in any weather (there is a sensational picture of one of them at work in a snowstorm), and screw down at the proper time break-wheels working on vertical axles projecting two or three feet above the carriage roof. Is it possible that the idea of a glazed look-out window projecting above or at the side of the carriage, that the brakesman may see where he is, has never occurred to the American railway mind?

Another passage in regard to the difficulties of fast running (the engine-driver, by the way, in America is called the "runner") seems to argue that a good many things are as yet far from being as they should be on American railways:—

"Fast time on a railroad depends as much on having a good signal system to assure the locomotive-runners that the line is clear, as it does on the locomotives. If he is always liable to encounter, and must be on the look-out for, obstructions at frequent grade-crossings of common roads, or if he is not certain whether the train in front of him is out of his way or not, the locomotive-runner will be nervous and be almost sure to lose time. If the speed is to be increased on American railroads, the first steps should be to carry all streets and common roads either over or under the lines, have the lines well fenced, provide abundant side-tracks for trains, and adopt efficient systems of signals so that locomotive-runners can know whether the line is clear or not."

This seems unsatisfactory enough, but it is a trifle to what we read in the chapter on the railway mail service, apropos of the duty of compensating the families of employés who are injured or killed in travelling on the railway mail carriages:—

"The danger to those within the postal cars is recognised by the railway people, and . . . . all that American ingenuity suggests in the way of con-

struction, both inside and outside of the cars, is provided. The body of the car is most substantially built, the platforms and couplings are of the most approved patterns, the trucks are similar to those used under the best passenger coaches" [how considerate!] "and the airbrakes and other safety apparatus are all brought into requisition. Within the cars are saws, axes, hammers, and crowbars conveniently placed in case of wreck, and safety-bars extend the length of the cars over head to which the clerks may cling when the cars leave the track and roll down the embankments, *as they often do.** In the year ending June 1888 there were 248 accidents to trains on which postal clerks were employed. In these wrecks four clerks were killed; sixty-three were seriously, several of the number permanently, and forty-five slightly injured."

This statement is from a chapter written by Mr. Thomas L. James, Ex-Postmaster-General. We can only say that it forms a most discreditable accusation against the American railway system. English post-office clerks would laugh if they were told that in being placed on travelling mail carriages they were engaged on a service of special danger.

There is far more of interest and information in the book than we have been able to allude to; and it is perhaps not entirely unsatisfactory to the English reader to find, on the authority of the Americans themselves, that with all their energy and inventiveness, we are obviously still ahead of them in the art of rendering railway travelling at once speedy and safe, and in general principles and details of management. American engineers are behind no others of this epoch in talent and resource, but American railway working seems not yet to have surmounted the drawbacks arising from an inherently loose system of construction and working, fixed upon it at the outset by the desire for economy and by the lack of that feeling of responsibility for public safety which seems much more developed in the English character in connexion with public works of this kind. England has the credit of having invented the railway system, with all its vast consequences to the world, and we may be allowed as a nation to feel some pardonable pride in the assurance that in its working and management we are still in front of all other nations.

* The italics are ours.

BERLIN "MANSIONS."

IT is a well-known fact that by far the greater number of the inhabitants of Berlin live on flats, in spite of the numerous evils and the great inconveniences pertaining thereto.

As most of the building-sites in the German capital have but narrow frontages in comparison to their great depth, the typical Berlin block-plan of an ordinary house shows the letter L, or in the case of a double house the letter U, the wings containing the bedrooms, the kitchen, and the back staircase. (Fig. 1.)

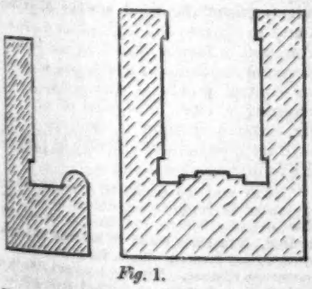


Fig. 1.

Very strict police regulations are in force referring to the area of the court-yard, the height of the front and court-yard elevations, the depth of the basement floor beneath the street level, &c., &c., and hence the architect is tied hand and foot when working out his designs.

These restrictions, combined with the unfavourable lines of the block plan, account for the bad disposition of rooms mostly found in a Berlin flat; yet the greatest faults are occasioned by the average Prussian architect not considering it necessary that every room

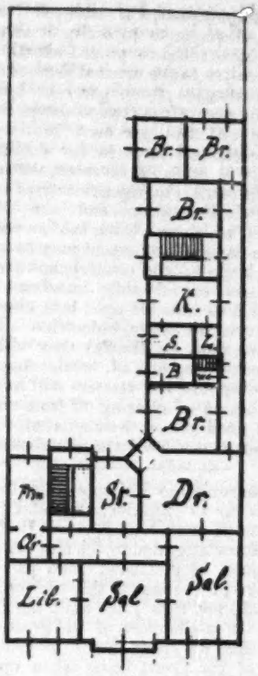
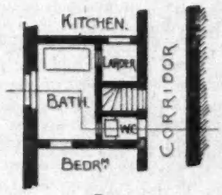
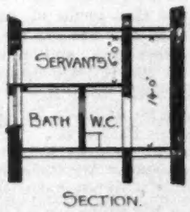


Fig 2.



PLAN.



SECTION.

Fig. 4.

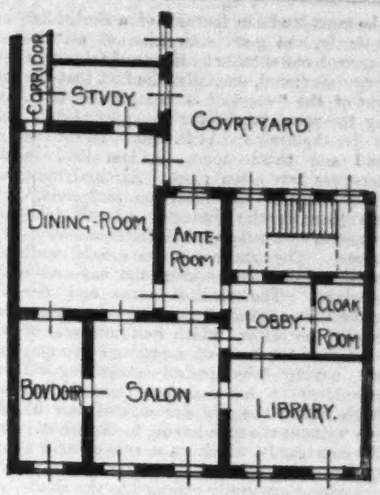


Fig. 3.

Types of Berlin "Mansion" Plans.

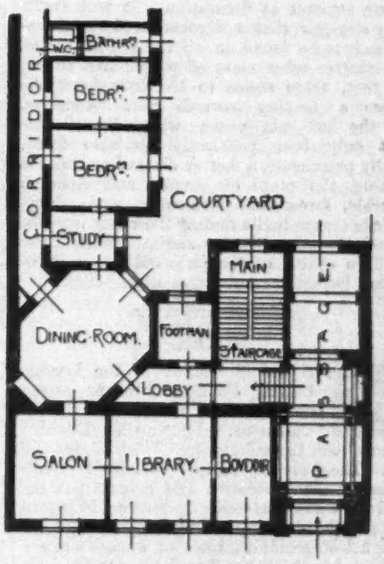


Fig. 5.

should be in direct connexion with a corridor. Hence one often finds that one bedroom has to be passed to reach the second one, or discovers that the gentleman's study is only accessible by steering between the numerous small tables of the drawing-room.

The most typical feature of Berlin planning is the so-called "Berliner-Zimmer," that room which is situated near the inside corner of the block plan, and which is mostly used as dining-room,—forming at the same time, however, the only connecting link between the front and back part of the flat. (See figs. 2, 3, and 5.) Many attempts have been made to avoid this double function of dining-room and passage, but these have generally failed, on account of the difficulty of obtaining light and air for the desired connexion.

The corridor and lobby are, as a rule, badly lighted and ventilated, both as a rule only receiving their light indirectly through glass panels in the doors, or at the best from some narrow area. Even the water-closets, up till a few years ago, rarely had any ventilation (see fig. 4), but now the police have prohibited the planning of such insanitary cupboards, and have gone to what is considered the extreme measure of requiring light and air direct from the courtyard, or, under special circumstances, from an area measuring at least 9 ft. by 6 ft. at its base.

It is wonderful with what little kitchen accommodation the average German housewife is satisfied; sculleries are never to be found, even in first-class flats; a pantry is a rarity, and such a thing as a well-ventilated larder is seldom thought of; brooms, dustpans, &c., are kept in some old wardrobe, but are also often used as a decoration for the kitchen walls. Each tenement, however, receives a good area of cellarage, and also plenty of attic room—the former being used for the storage of coals, potatoes, and wine cases; and the latter taking the place of the English box and lumber room.

Bedroom accommodation is very small in comparison with the number of living and reception rooms, so that families can very rarely have a "spare bedroom" at their disposal. The servants' rooms have, till very lately, been a disgrace to a civilised country; but a short time ago the ever-vigilant police have also made some regulations which prohibit the servants' rooms in newly-built houses being placed, for instance, above the larder or bath-room, with a height of only 6 ft. (a state of affairs that has been common up till now). Bath-rooms are only to be found in flats of a higher class, or in those of very modern date; and even then they are looked upon as only a secondary consideration.

The most laudable features of a Berlin flat are, firstly, the good connexion of all the rooms with one another by means of folding or sliding doors; and, secondly, the fact that the height of the "étages" is not stinted, 13 ft. being the usual height for the ground-floor, 15 ft. for the first, and 14 ft. and 13 ft. for the second and third floors,—seldom less, in better-class flats often more. Air and light are abundant in the reception and living-rooms (barring the dining-room) and bed-rooms, and, as a rule, in both front and back-staircases. The staircases are mostly well planned, seldom lack width, and have easy step-height. The front-staircase and the outer-hall are generally richly decorated, especially the latter, which has, however, of late assumed the form of a carriage passage; a law having been passed compelling all householders to have a free thoroughfare through which the city fire-engines can be driven without the men having to dismount.

The courtyards, which as a rule contain a pump, are well paved and drained, and always have a corner especially assigned to the dust-bins of the various tenants.

The elevations of the courtyard are kept as plain as possible, stucco with stone dressings, or brick with stucco dressings, being mostly used. The front elevations are for the greater part finished in cement with stone dressings, and always show some attempt at decoration. It will strike any stranger that a decoration of the elevations is to be found in all the Berlin streets, no matter what class of people live there; in fact, there seems to be throughout the town a leaning towards over-decoration. In the last ten years, when Prussia has not only been politically but also financially prospering, a better class of material is taking the place of plaster and cement; marble, freestone, terra-cotta, and glazed bricks are gradually finding their way into the street-fronts, so that the Berlin thoroughfares will, in course of time, not only show decorated, but solidly decorative, architecture.

NOTES.

THE second reading of the London County Council Bill was passed on Tuesday in the House of Commons, subject to Mr. Ritchie's amendment to omit clauses 55, 56, 57, 58, and 75. These are all clauses referring to questions of administration and general powers. All the clauses referring to reforms in regard to details of building regulations, such as heights of buildings, lines of streets &c., are included in the Bill and will have to be dealt with in Committee. A greater blunder in the path towards the amendment of building regulations could hardly be made. A Committee of the House of Commons is one of the most unfit bodies to deal with such questions in detail, and the result will probably be most unsatisfactory. The County Council should have avoided all details and asked for a general clause conferring power to deal with questions of the construction and laying out of buildings and streets, &c., and to make by-laws on the subject as might seem best for the public benefit. By thrusting details of this kind into an omnibus bill, they run the chance of either not getting what they want, or getting it in such a manner as to tie their own hands.

THE great strike of coal-miners is one of those events which force themselves upon the attention of a vast number of industries besides the one most directly affected. At this time last week strong hopes were entertained that it might be averted, but the determined attitude of the men failed to induce the owners to concede the advance demanded; and, consequently, work is suspended at a large proportion of the collieries. The immediate effect was that all available coal was advanced to prices which many manufacturers cannot afford to pay—preferring rather to close their works. Thus, an immense number of operatives and others are thrown out of employment, in addition to the miners. All attempts to arrive at an understanding have hitherto proved abortive, the only alternative to the original demand for an immediate advance of ten per cent. being an offer on the part of the men to accept five per cent. now and five per cent. in July,—to which the masters have so far declined to accede. It is probable, however, that at the meeting between the representatives of the Coalowners' Federation and the Miners' Federation, which was being held as we went to press, a basis of settlement may be arrived at. The trade of the country, however, has already been considerably interfered with, and much loss inflicted upon both employers and employed in other industries. If the men resume work on Monday they will have lost a week's wages, and, while they have been standing idle, the masters will have had the satisfaction of clearing off from the pit-banks, at good prices, hundreds of tons of stuff hitherto considered almost valueless.

ON adjourning the Railway Rates Inquiry,—as far as England and Wales is concerned,—until after Easter, Lord Balfour of Burleigh drew attention to the fact that if the Court should be precluded from presenting their report to Parliament this Session, legislation could not take place until the Session of 1892. It is therefore of the greatest importance that no delay should be caused by the time of the Court being taken up with unnecessary evidence. As eighty witnesses have already been heard, it is probable that there are not very many more to follow; and Lord Balfour seemed to intimate that he should rest the responsibility upon them should the Inquiry be so delayed that insufficient time is left for the preparation of the Report this Session. In the course of the evidence at the concluding sitting last week, a large sender of "smalls,"—*i.e.*, consignments of less than 500 lbs.,—paid a high compliment to the Parcels Post. He showed that 80 per cent. of the traffic sent by his firm was in the shape of "smalls," and mentioned that whenever they came within the Parcels Post weight and dimensions they preferred to use that mode of conveyance. He declared that the traders delighted in having this alternative, and proceeded to remark that if the railway companies had kept more in touch with the public there would have been no necessity for the institution of the Parcels Post at all. "That shows how well the Government Departments do their work," interposed Mr. Courtenay Boyle,—a remark which certainly holds good in the case in question, but which one would hesitate to make of general application.

THE "betterment" question came before the House of Commons on Tuesday, in relation to the Strand Improvement Bill, promoted by the London County Council. The question, however, was not really discussed, and if the clause remains after the Bill has gone through Committee, it will probably give rise to a debate on the third reading. The matter, therefore, still remains before Parliament, and we shall take an opportunity in the course of the session to refer to it again, and at due length.

A REACTION seems to be setting-in regarding the proposed underground railway for Edinburgh. At a meeting of the Edinburgh Trades' Council, held last week, the report of the committee upon the subject was read, from which it appeared that the committee were of opinion that the proposed railway from West Princes-street to Leith would be of great benefit to the citizens, and would afford a ready means of transit between the three great shipping ports of Scotland,—Leith, Glasgow, and Greenock. It was recommended that the Trades' Council should petition the Town Council to withdraw their opposition to the preamble of the Bill and confine their action to preserve the amenity of the city. The report was adopted by 28 votes against 4. The solicitors for the Caledonian Railway have written to the Town Clerk a letter to be submitted to the Town Council of Edinburgh submitting a number of concessions which the directors of the railway company propose to make with a view to disarming the opposition of the Council to the underground railway scheme.

PROFESSOR RASCHDORFF'S latest design for the proposed (Renaissance) "Dom" for Berlin is now under consideration at the "Cultus Ministerium;" and, as far as rumour goes, it is believed that the present scheme has found friends there, and has been recommended to the Emperor for approval. Even if the rumour proves to be correct, it will take at least a couple of years before the foundation-stone can be laid, not only on account of the time needed for working out the design, but also on account of the time required for the pulling down of the old "Dom," the erection of a provisional church for the "Dom" community, and many other preparatory works. We are not permitted to give any description of the present design until the sheets have passed through the different stages of bureaucratic criticism; but it may be as well to mention that Professor Raschdorff has given up his former idea of connecting the old "Schloss" with the proposed "Dom" by means of a communication-gallery over the thoroughfare which runs between the two sites.

IN looking through the annual report of the municipal authorities of Berlin, we find that they have come to the conclusion that wood pavement is not advisable for the Berlin thoroughfares, and that further new work in this material has been prohibited. In the same division of the report we find figures referring to the total area of paved roadways in the town, and the ratios of the different sorts of pavement used; according to these statistics we find that 574,000 sq. mètres of asphalte have so far been laid, and that this material is recommended very highly. It is of some interest to notice this experience and opinion in Berlin, just when such a cry is being raised against asphalte in London.

A FORMER English architect who is now an Australian (Sydney) architect, Mr. J. Sulman, whose name will be familiar to many of our readers, has been reading a paper to the Melbourne Architectural Association on "The Laying-out of Towns," which appears to have attracted a great deal of attention, and has been made the subject of leaders in various Australian journals, professional and non-professional. The paper dealt with the subject both from a sanitary and artistic point of view. In the latter respect Mr. Sulman's preaching was generally against the rigid system of laying-out a city in squares and right-angles like a gridiron, and in favour of making the most of picturesque incidents in a site, and of providing for central points of architectural effect in planning a city. The kind of advice which Mr. Sulman thought it requisite to give on sanitary questions of site may be judged from the following quotation:—

"Much may no doubt be done by the skill of engineers to improve an unhealthy site, but in a new country, where the land is practically unlimited, it is little short of a crime to permit any town to be formed which, from its location, will encourage disease. The most potent evils to guard against are swampy or flooded land and an impervious sub-soil. Of the former there are by far too many examples. I will describe one. In a rich agricultural district of the parent colony, a Government township was laid out many years ago on rising ground near the banks of a river. The upset price was low, but just on the other side of the stream a large area of land was possessed by a drunken old settler. It was, however, flooded in wet seasons. So far as position was concerned, either bank would serve, as the river was bridged. Cheapness, however, won the day, and the flooded land was purchased in blocks at the price of a bottle of rum by ignorant new comers, and on it the town was built. Every few years the river comes down a banker, covers the town several feet deep in mud and water, and leaves behind a legacy of who can say how much suffering and

death! Now the inhabitants are petitioning for extensive works of embankment, and in course of time will, no doubt, obtain a large grant of public money for the purpose. If surface unsuitability is thus ensured, what may we expect when the subsoil is in question? Its importance as bearing on the health of a town can scarcely be exaggerated, but it rarely receives a thought."

The opinions expressed by Mr. Sulman in the paper are such as would be generally accepted as wise and sound by the profession in the old country, and perhaps he may induce those in the new country to give attention to considerations which they have hitherto overlooked. Australia is a continent in which there may still be new cities to plan, and where it is not too late to learn to plan them in the best way from the commencement.

ELECTRICITY as a means of locomotion has not made much progress in the United Kingdom; Bessbrook, Blackpool, Brighton, and Portrush being our chief existing examples. We shall shortly possess a far more important installation in the City and Southwark Subway, which may now be looked upon as an assured fact. Its extreme length, however, is under four miles, even if completed, and there are some difficult problems for the engineers yet to solve. In the United States this same slow progress is not observed, if we may judge by a paper lately read by Mr. F. J. Sprague, of New York, before the National Electric Light Association of America. Two years ago, the paper tells us, the electric railway business was in an experimental stage, and it was difficult to get a dollar for investment, but to-day it demands the best energies of two great corporations and a number of smaller ones. The business done this year, it is said, will probably amount to 6,000,000 dols. There are about 130 towns in the United States with one or more electric railways in operation, construction, or under contract. These comprise 1,500 miles of track, and 1,700 motor cars requiring 3,000 motors of an aggregate capacity of 45,000 horse-power, and a daily mileage of about 100,000. Gradients of 12½ per cent., and more recently 14 per cent., have been ascended with loaded cars. Gradients three miles long, varying from 4 to 8 per cent., have also been ascended, the work done being beyond that possible with horses. In crowded cities speeds have been doubled 50 per cent., and the electric car has shown that it can be run faster on both up and down gradients, and can be stopped or started faster, than can a horse-car. On the whole, it would seem that the Americans are outstripping us as much in electric traction as they have done in electric lighting. It is doubtful, however, whether we shall lose much, on the whole, by our steadier and more cautious policy.

THE British Museum has recently become possessed of a valuable and very curious vase, formerly in the collection of the Earl of Carlisle at Castle Howard. The existence of this vase has long been well known, and it is catalogued in Dr. Klein's "Meistersignaturen," p. 210. Probably, however, few archæologists have had the opportunity of inspecting the original. It is a krater signed by the late artist Python, and represents a curious scene,—the interrupted burning of Alkmene on the pyre. Alkmene is seated on a kind of altar at the back of the pyre, which is being kindled by Amphitryon and Antenor. Death seems imminent, but the Hyades, the rain nymphs, mercifully intervene; they pour down water from the arch of the sky above Alkmene, while Zeus looks on, as a naturally interested spectator. Up to the last few weeks the only publication of this curious vase was in the French section of the Roman *Annali & Monumenti*—a section missing from many, if not most, archæological libraries,—from all, we believe, in England. However, a few weeks back Roscher's "Mythological Lexicon" reached *Hy*; and he gives a woodcut both of the Carlisle vase and another of analogous type. His double articles on the *Hyades* should be consulted by those who wish to appreciate the new acquisition.

THE Swedish Government, through its Geological Survey, has recently issued two further instalments of the researches of one of its officers in regard to the stone industry of Great Britain. The first of these* deals with the methods of working sandstones and limestones, and of shaping slates, in which the various machines now in use are brought under review; and the second,†—a more important work,—is divided into three sections:—(1) Gives a general account of the building stones of England and Scotland, in which the articles that have appeared from time to time in the *Builder* on the subject are freely made use of and acknowledged; (2) contains notes on building construction with suitable illustrations, showing certain methods of placing stones in rubble walls, rustic work, ashlar, &c.; and (3) in summing up the two first sections, indicates that it is possible for Swedish architects, by constructing random-coursed and similar walls in the usual English style, to make use of many sandstones, limestones, &c., that occur in Sweden, which have hitherto been considered too expensive for building purposes in that country. In addition to the diagrams referred to, the work is illustrated by two photo-lithographs of buildings in Aberdeen, which clearly explain the author's meaning; and the practical suggestions throughout the treatise cannot fail to be of great service to the Swedish building trade.

THE progress made in framing a new charter for the Royal Scottish Academy is anything but rapid. It is supposed to be at present in the Privy Council office, and it appears that there are points of disagreement between the Academy and the Board of Manufactures in reference to the teaching of students, which may account for the delay. No arrangements have as yet been made for the hearing of parties, and it will not probably be for several months to come that the charter will be in shape. The Academy Exhibition this year is well patronised, and the sales of pictures are considerably larger than last year, although the number of works exhibited is much fewer.

THE Twyford Abbey Estate, in Middlesex, covering about 520 acres, lying between Ealing and Sudbury, and two large dairy farms adjoining, have been placed in the market. The modern nineteenth-century Gothic mansion, designed by Atkinson, and recently occupied by the late Dowager Baroness Gerard, is traditionally stated to occupy the site of an old religious house. The former residence, moated, was rebuilt by Mr. Willan, who had purchased it from the Cholmondeley family. The name of the parish is said to be derived from the two fords across the river Brent. Twyford and the adjacent Perivale, or Greenford Parva, parishes are the smallest and least-populated of any at their distances from London, and retain much of their rural aspect. In 1831 the populations were 43 and 32 respectively; they are now 75 and 34. Not many years ago the "Abbey" was the only house in Twyford parish. In the little church, standing within the grounds, was erected a monument to Henry Bold, the poet, who died 1683. Perivale Church, by the riverside, was restored about fifteen years ago; it has a curious wooden tower. To the north stands a quaint half-timbered house, one of the seven or eight in the parish.

THE Morgans automatic signalling system, shown during the past week at the Westminster Palace Hotel, is an American invention of very ingenious conception, well thought out in its details. The system consists of a central police-station and, say, one hundred street signal-posts, in each of which there is a locked box containing two discs, one for transmitting, the other for receiving, certain specified messages, and a telephone, by which conversation, if needful, may be carried on between the officer at the street-box and the central station. As it is impossible for every police constable to be a telegraph operator, a number of short messages, such as "send officer," "send waggon and four men," "crowd threatens," &c., are printed on a dial. All the policeman has to do is to unlock the "office door," put a pointer to the message he desires to send, and close a hasp. As soon as the message has been received the pointer returns to its ordinary position automatically, while the number of the post or constable from which the message has come is duly recorded at the station. Each signal-post has also a red light fitted in its lantern. This light is ordinarily out of use, and is put on when needed to call attention by the central station or by the officer on the beat. The means by which the signals are worked are electricity, magnetism, and clockwork. The electric-wires are run out radially from the central station, one wire to each street-post, so that if any wire be broken or damaged the others are not interfered with. The electric current energizes the magnets, which then draw back the detents of the clockwork, and, as each street-wire is connected with its own representative portions of the central apparatus, each street signal acts automatically with the central station. If the officer on a beat sees a red light he reads the signal in its box. If he wants help he can ask it by his signals without leaving his place, without shouting or whistling, or messengers, without attracting attention. Keys may be furnished to residents or caretakers by which they can set up the red light of the nearest street-post, and so call the police. As this key is inscribed with the number of the residence, the policeman on coming to the box knows where his assistance is required. Special boxes can be fitted in private houses in direct communication with the nearest central station.

THE most important as well as the largest work at Mr. Wallis's Gallery, the thirty-seventh annual exhibition of which opened this week, is Professor von Uhde's life-size painting of "The Last Supper" (61). This is one of the most remarkable examples we have seen of the modern realistic spirit in the treatment of scenes from the New Testament. The apostles are frankly represented as labouring men in working garb, but with faces of great interest and variety of character. The head of Christ is very beautiful and pathetic in expression, without partaking of that too sentimental character with which it has too often been invested by artists. "Suffer Little Children to Come Unto Me" (62) by the same painter, has also great merit in the character and expression of the children, but to liken them to Dutch children of the modern period is carrying realism a little too far, or rather it is not true realism at all. Nevertheless Professor Uhde is an artist worth knowing. Another new name at the Gallery is that of Professor Liebermann, a painter of peasant life. His largest work, "Women Mending Nets, Katwyck, Holland" (60) shows in the foreground a remarkable figure of a coarsely-clad peasant girl standing and hauling at a net with that kind of unstudied energy which at times gives a kind of sublimity to the simplest personality. His picture of "Flax Spinners, Holland" (59) has a pathos in its representation of homely toil which reminds one of Millet. We are indebted to Mr. Wallis for introducing the works of these two remarkable painters to London. Among other works to be looked at are Seiler's exceedingly clever scene in a "Buffet at a Railway Station" in the Tyrol (29); the same painter's two finely-studied figures in "The Argument" (41); Walter Firle's "First Communion" (33); Mukacsy's "The Two Families" (34) a previous edition of the brilliant painting exhibited at the Royal Academy a few years ago, but hardly equal to it; and Heilbuth's "On the Seine near Bougival" (37) a characteristic example of this painter, with a group of French ladies going boating in elaborate

* Om bearbetning af Sandsten, Kalksten och Taksiffer i Storbritannien. Af Hjalmar Lundbohm. Stockholm.

† Engelska byggnadsmaterial och byggnadssätt samt de senares tillämplighet i Sverige. Af Hjalmar Lundbohm. Stockholm.

costumes, as if they were on their way to an "At Home."

THE collection of sketches of London by Mr. Herbert Marshall, on view at the Fine Art Society's Gallery, includes a great many charming studies of London architecture and street scenery, but there are two queries we should propound in regard to it. First, are the effects of light and colour shown in many of these sketches really London effects, or are they not rather effects which the artist would like us to see or to think we see? "Battersea Church" (9) is a river-scene looking more like Venice than the Thames, in light and colour; other views of well-known London streets, though most effective in themselves, impress us as unfamiliar and unlike the place as we know it. Did any one ever see Westminster Abbey from Dean's-yard (58) show so white and bright as Mr. Marshall makes it? Another query is, whether the artist has done himself justice in the drawing and general treatment of the architecture. "St. Paul's from Cannon-street" (3) is badly drawn; so is St. Mary-le-Bow (32), rising from a street also which does not in the least suggest Cheapside. In the view of the Horse Guards (17) the clock turret is absolutely on the wrong side of the centre of the pediment, considering it in relation to the perspective of other portions of the building. The portico of the church in Covent-garden Market (34), which forms a foreground object, is also very inadequately treated. This would be expected at the hands of a landscape-painter merely, but Mr. Marshall professes to be a painter of scenes in which buildings play a principal part, and artists who take that position should be careful of the drawing of their buildings as well as of the effects. Among the best sketches in the collection are "St. Martin's-lane" (67), "Back of Kensington Palace" (68), "Autumn Afternoon, Chelsea" (81), "St. Mary-le-Strand" (83), and "Barges at Low Water" (89) near Lambeth Bridge. We may add one other query to our two former ones—why are the catalogues at these sort of exhibitions to be prefaced by shallow small-talk on the subject by people whose opinions on art are of no recognised value whatever, and whose names are merely used as a bait to catch the more ignorant section of society?

THE NORTH DOORWAY OF THE ERECHTHEION.

THE large doorway in the north portico of the Erechtheion,—Ἡ ὡραία πύλη,—"The Beautiful Door" as it is called by the Greeks, has generally been accepted as contemporary with the rest of the building.

Mr. R. W. Schultz, during his investigations at Athens last session, while engaged on the work of collecting the mouldings of the buildings on the Acropolis, observed certain peculiarities in connexion with this door, which led him to doubt this general assumption, and last week he explained his views at a meeting of the British School there.

He contended that none of the door now *in situ* is part of the original work; that the present jambs belong to a period not far removed from the time of the building, although not contemporary; and that the lintel, cornice, and brackets are a still later addition. In connexion with the first point, he referred to a curious rebated stone on the west side of the present lintel, which he thought belonged to the original lintel which had been damaged and cut out, leaving the ends in, and he explained the various reasons which had led him to come to this conclusion. He next went on to argue that the unfixed "Θῆραι" of the British Museum inscription (the word having already been assumed to mean, in this instance, the linings and not the leaves of a door) which had generally been appropriated for the east door, could not have belonged to it on account of their dimensions not working in; and he showed how they exactly fitted this north door if they were made in two pieces in the height, which, as they were not constructional parts, but mere linings, was highly probable. He drew attention to the existing fragments of another door, one of which is now in the British Museum (Inwood, plate 20), which probably belong to the east door, and mentioned how certain indications on these had made him think the doors had originally had bronze linings inside the stone ones. He concluded that the first north door consisted of a lintel built in with the walls, and having mouldings worked on it, and of thin jamb linings having a projection of about 2½ in. from the wall face, and with bronze linings inside.

The lintel having been damaged it was cut out, leaving the ends in, and heavier jambs were inserted to take the whole weight of the new lintel. The return face of these jambs was dressed right through, and the inner bronze linings done away with. This second lintel was not, however, he thought, the one now in position; the nature of the ornament, which, although a continuation of that on the jambs, differs greatly from it in character, being much less refined and bearing on its face clear indications that it must be a late copy, faithful in general form but lacking the spirit and refinement of the original. Amongst other points in this connexion he showed how, in the rosettes of the jambs, the centres have been bored out for the insertion of a wood plug, in which was fixed a central gilt bronze disc, while in those of the lintel this has been worked solid on the stone in a convex form and was probably merely gilded over. From the general character of the work this lintel might, in his opinion, have been inserted about the second century B.C. The brackets on each side of the lintel he put down to the same time; he did not think the north door had originally any brackets at all, but merely a plain cornice. The position of these brackets appeared to him both constructively and decoratively false, set back half hid behind the projecting architrave, so that their inner face was almost lost, and in reality of no value as supports to the cornice over. He suggested that they might have been copies from the original brackets of the east door, mentioned in the inscription, which were probably of similar detail, but more suitably placed in relation to the other parts of the composition, and he showed how the one bracket which no longer existed on west side, did not tail through the wall, but had been merely dowelled on to the face.

He drew attention to the nature of the ornament on the cornice of the door, which varies very much from that on the wall-band over, to which it bears a certain resemblance, and accounted for this variety of type by suggesting that it had been done by a workman who, limited by the nature of his work on the lintel and brackets to as exact a reproduction of his original as he was capable of, had here given free play to his own ideas of what the ornament ought to be like.

He was influenced in his conclusion that this was of later Greek time and not Roman by observing in it several characteristics similar to the work on the later Ionic temples of Asia Minor, and by the fact that had it been the latter it would have been a close replica of that on the band over, and he instanced the work on the remains of the Temple of Rome and Augustus lying to the east of the Parthenon as an example of the Roman rendering of Greek detail. As further evidence of the later insertion of this lintel and cornice he instanced the holes cut on the underside of the stones over for the purpose of needling up the wall temporarily during the alteration, and the way in which the stones have been wedged up afterwards. He also alluded generally to the other various evidences of fixing the cramping to jambs and lintel.

The thin inner jambs and linings now round the door, he said, were put in, perhaps, in quite late Christian times, partly as a support and partly to hide the broken underside of the present lintel, which had been seriously cracked and chipped off on the under-edge.

It is, of course, impossible in a short summary to go into all the arguments adduced in support of these theories, which Mr. Schultz threw out, rather as points for consideration, than as definite fixed opinions; but we trust that it will be possible to examine them in detail when the school papers of the present session are published later on in the "Journal of Hellenic Studies."

Edinburgh.—After an expenditure of 6,000*l.* in alterations upon the Palace Hotel, Prince's-street, which was acquired by the Scottish Liberal Club, it is now in possession of the members, and it may be considered one of the finest club-houses in the country.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ninth ordinary general meeting of the present session of this Institute took place on Monday evening last, Mr. Arthur Cates (Vice-President) in the chair.

Proposed Extension of Premises.

The Chairman announced that a special general meeting of members only will be held on the 31st inst., at 7.30 p.m., "to receive and consider a recommendation of the Council that the Royal Institute of British Architects do enter into arrangements for obtaining a lease of the shop premises now vacant at 9, Conduit-street, and to authorise the Council so to act."

Examinations for Architects.

The Chairman also read the following requisition addressed to the Council:—

"Gentlemen,—We, the undersigned, being of opinion that it would be of advantage to the profession and the public alike, if all hereafter seeking to practice as architects were compelled by statute to pass a similar examination or examinations to those recently established by the Institute with such signal success, desire to test at as early a date as possible the opinion of the whole body of professional members of the Institute.

We therefore send this requisition, under By-law 69, for a special meeting to be held to consider the subject, and to propose the following resolutions:—

'1. That at as early a date as possible statutory powers should be sought to establish, as in other professions, a system of compulsory examinations to be held by the Institute, and to be extended to all architects hereafter entering the profession, whether as members of the Institute or not.

2. That when such compulsory examination comes into force, the position of all existing architects shall be completely respected.'

Whether these be carried or not, we desire, under By-law 62, or if that be not applicable, then by resolution, to propose

'That a poll be taken by voting papers, in order that, under any circumstances, the opinion of the entire body of professional members may be ascertained.'"

He added that, in accordance with that requisition, the Council had appointed a special general meeting on the 31st inst., at 8 p.m., to consider it.

Drawings of Brick Buildings in North Germany.

Mr. Alfred Strong, Fellow, then read the following short paper:—

Towards the end of last year I had a letter from Professor Otzen, an architect in somewhat extensive practice at Berlin, in the course of which he said that, during a recent visit to England, he had noticed the very limited use made of moulded and glazed bricks in this country; and having largely used them himself, he asked whether our Institute would care to see some of his works so executed. I referred the suggestion to our Literature Committee, with the result which you see on the screens to-night. There are altogether ninety-nine drawings and eleven photographs, representing twenty buildings, of which fifteen are executed, and the rest either in contemplation or in course of execution, and I hope you will agree that the exhibition is an interesting one. The subject of moulded and glazed bricks as used in the North of Germany—I purposely exclude their use in Spain and Italy—is not a new one within these walls. Forty years ago, on February 18, 1850,* my old friend Charles Fowler—he was Charles Fowler *junior* then—read a paper on "Mediæval Brick Buildings in the North-east of Germany," which was reprinted by order of Council in 1874, probably *à propos* of another paper, read on November 17, 1873,† by Mr. J. Tavenor Perry, on the "Mediæval Brickwork of Pomerania." Mr. Fowler described the churches, town-halls, and gates of Stralsund, Brandenburg, Stenthal, Stargard, and Lübeck; he showed that stone was used for tracery in early examples, but that from the end of the fourteenth century brick only was employed, "and we find even such parts as crockets and finials executed in brick." Again:—

"There is one feature in particular which deserves attention,—namely, the introduction of a white plastered ground to relieve the forms of tracery. . . . The use of dark brown and black glazed bricks was also common."

In the discussion which followed, Mr. Smirke said,—

"He had seen churches of brick at Hanover and Hamburg, with deeply-moulded jambs and slender mullions of brick, and he thought we in England are scarcely aware of the great capabilities of terra-cotta."

* See *Builder* for March 9, 1850.

† For a report of the discussion which followed this paper see the *Builder* for November 22, 1873.

Professor Donaldson also remarked that,—

"In this country brickwork as applied to Gothic detail had never been carried out to the same extent as in the Low Countries."

I have unearthed a few examples of such work out of my sketch-books, and enlarged copies,—about half-full size,—are on the screen. They illustrate the mode in which effect was obtained by *rendering* the ground between the moulded bricks, and how patterns were obtained by the repeated use of a few simple moulds. Professor Otzen's adoption of this construction occurs frequently on these drawings. Stone is, and always was, a luxury in the North of Germany, and the architecture of the districts far away from the quarries of Saxon Switzerland and the Hartz Mountains naturally developed out of the material readiest to hand. In his paper, nearly fourteen years later, Mr. Perry says:—

"When stone was used, which was but rarely the case, it had to be shipped from Sweden, which in those days was a costly thing; but the skill with which ornamental features were moulded in clay caused less desire for carved stone than might otherwise have been felt."

Mr. Perry also mentions Stralsund, New Brandenburg, and Stargard, as also Stettin, Bergen, and Sagard on Rügen, and other examples. Describing the tower of St. James (1370) at Stralsund, he says:—

"The whole of the tracery and arcading is filled in with rich brick casping, which, with the ornamental bands and the mouldings of the entrance, is very highly glazed." At St. Nicholas, Stettin, he notices "a richly moulded band of vine-leaves in blocks about 12 in. square, carried along under a black string;" and at Pomlau, "a little turret, octagonal on plan, two stages high, built entirely of glazed bricks in various colours, chiefly green."

That, in the late Gothic straining after effect, the limits of sound construction were often passed cannot be denied,—as, for instance, at St. Mary's, Lübeck, where brick mullions about 6 in. wide are carried up to 60 ft. or more, apparently only kept in their place by the saddle-bars to which the lead lights are attached. Still, in spite of these drawbacks, there are many examples of good work scattered up and down the North of Germany, and the student may with advantage examine both the ecclesiastical and the secular buildings from Hanover to well up the Baltic, and from its shores southward and westward. In connexion with this subject, Mr. Street's pamphlet on Lübeck and Essenwein's examples—both in the Library—will be found interesting; the latter, perhaps, less from the point of view of *English* Gothic than as giving valuable hints in the use of the material under discussion. Having quoted and said this much, in the hope of starting a useful discussion on the *pros* and *cons* of the more extensive use of moulded, and especially of coloured and glazed bricks, in this country, I now turn to Professor Otzen's works, which show that he has carefully and exhaustively studied the works of his ancestors, as also the manner in which he has followed in their steps. So far as I know, Mr. Otzen was the first German architect to revive the free use of ornamented bricks in church architecture, and I can remember the sensation which his first church in this style (St. John's, Altona, near Hamburg, erected in 1868-73) made at the time, and being struck with the rich effect, not dark and gloomy, but rich and warm, which the use of well-blended colours and judicious glaze here and there produced. I visited the brickyards where the materials had been prepared; some specimens are on the table. Unfortunately, this church near Hamburg is the only one of Professor Otzen's works which I have had an opportunity of seeing, and therefore I can only refer you to the meagre information furnished by the slips in your hands. The example thus set has since found a certain amount of following, chiefly in the old Hanse Towns, where a limited use of moulded and coloured and glazed bricks has been made in warehouses and private buildings, adding life and interest to what otherwise appear somewhat prosaic compositions. I am sure that a careful examination of the beautifully-prepared drawings which surround us will well repay the lover of colour in buildings, and I cannot do better than close these few remarks as Mr. Perry closed his Paper:—"I trust," he says, "you will see that there are many points of excellence to be noted in these buildings, erected as they are of materials so similar to those at our own command, and that English architects may learn something from the mediæval brickwork of the North of Germany."

Mr. Charles Fowler, in proposing a vote of thanks to Mr. Strong, said that Professor Otzen appeared to have studied the old examples, and, though it could not always be said that he had improved upon them, he seemed to have imbued himself to a considerable extent with the characteristics of the style. From his (the speaker's) own observation, the ornamental work in the old brickwork,—he did not refer to such as was formed by moulding, but to such things as crockets and finials,—was carved out of the brick before it was burnt, by means of wire. The workmen apparently learned to use this very skilfully, and though the results were not very minute in detail, they were effective and characteristic. He happened to be engaged in studying under the late M. de Chateauneuf in Hamburg when that gentleman was restoring St. Peter's Church in that city, and he visited the brickyards which had supplied the bricks for the churches built in the fourteenth century. These brickyards had never been entirely closed, and they had supplied the bricks for the restoration of the church in 1844-5-6. These bricks were large, and quite different from those made for ordinary construction in that part of the country, the dimensions being 12 in. by 6 in. by 3 in., of a fine rich purple colour, very hard and well-burnt. The mortar seemed to have been made of the best lime he ever came across. It was beautifully crystallised, and so extremely hard that after 500 years the joints had the polish of the trowel as left by the original bricklayer. The joints were thick, sometimes measuring quite an inch, showing that the work must have been carried up slowly, and that the mortar got hard before it had time to bulge out. There were a great many interesting examples of this stamp of work in that part of Germany, but his information in regard to them had all been in print for the last forty years in the paper he read.

Mr. William Woodward remarked that a fine specimen of the skilful and artistic disposition of brickwork, in cornices and mouldings, was to be seen in a church off Great College-street, Camden Town.

Mr. Hugh McLachlan said that when holding the Godwin Bursary, he had the pleasure of seeing the Church of St. Johannes at Altona, a splendid specimen of Gothic architecture. These coloured bricks, tiles, and glazed terra-cotta had been brought into use with great aptitude. This church contrasted with Sir Gilbert Scott's great church in Hamburg, which was built altogether of stone. It might be said that some of Herr Otzen's work was too glaring in colour, and the way in which green was introduced was a case in point. It seemed that in this country we could not produce the splendid materials Herr Otzen was able to use. These came from the east of Germany and Silesia, and they appeared to be superior to anything in this country. He was sorry that the specimens he brought home and presented to the Institute had been hidden away in some closet.

Mr. J. M. Brydon seconded the vote of thanks to Mr. Strong. When he saw some of the churches in Altona, he was not struck either with their architecture or their colour, which was somewhat crude. It was the shadow, but not the spirit, of Gothic. To use moulded bricks was to go the wrong way to work, an effect being obtained which entirely destroyed the spirit which should be introduced into such buildings. The only way to get effect was to fall back upon the old principle of cutting the bricks after they had been burnt. The green colour was certainly very crude and strong, and in the matter of mixing the colours, in glazed or unglazed bricks, makers in England were far ahead of any on the Continent. Mr. Butterfield had shown the way many years ago in the case of All Saints, Margaret-street.

Colonel Prendergast proposed a vote of thanks to Prof. Otzen for so kindly sending his splendid collection of drawings for them to see. It could not fail to be beneficial to the members of the Institute if they got those who were exercising their professional duties in other countries to assist them in their researches here.

Mr. William White seconded the vote of thanks to Prof. Otzen. He considered that the question of the use of stone or brick was very much dependent upon the matter of cost. The same amount of precision could not be got in brick by moulding as by cutting. A brick which was made 4 in. or 5 in. in thickness would not shrink in the same way as a brick made only 2½ in. or 3 in. thick. The question would always be between the cost of brickwork and the cost of stonework, and at the present moment he was hesitating, in the midst of an essentially stone country, whether or not he should have to put up a large building in brick simply on account of the cost.

Mr. Aston Webb said he could not help feeling that this question of the treatment of brickwork which had been brought before them that evening was essentially English, and not alone German. The English Tudor brickwork was as fine as any he had seen abroad. The architecture of the Elizabethan period brought out some magnificent brickwork, and, again, in the reign of Queen Anne, there was brickwork equally fine, while a great deal of our modern brickwork would stand comparison with that of any other country. Mr. Strong had given the date of one of Prof. Otzen's churches as 1868, but many fine brick churches had been built in England before that. Mr. Street's church of St. James-the-Less must have been erected about that date, and was one of the most charming examples of modern brickwork. Mr. Butterfield, in his house for the Society for the Propagation of the Gospel, produced another example that claimed the admiration of all who saw it; and although Keble College might have been thought too bright at first, anyone who saw it now would notice that it had wonderfully toned down, and was a most picturesque and essentially English building. The brick buildings of Chester, inaugurated, he believed, by Mr. Douglas, were also essentially English, and he did not think anything in Europe could be found to beat them. Mr. Waterhouse and many others had worked in brickwork, and, he need hardly say, with the greatest possible success. The great difficulty in regard to coloured brickwork in London was that in a short time the colour disappeared. He remembered Mr. Edward Barry describing his Endell-street schools, and being quite frightened at their brightness of effect, but in a few years the pattern of the brickwork quite disappeared. With regard to glazed materials, the glaze generally given seemed to destroy all lines, and if some of the manufacturers would try to introduce a glaze which would protect the surface of the brick, and at the same time not give the great reflection which the brilliant glaze gave, a material might be found which would enable architects to carry out brick-building in towns which would be satisfactory and enduring.

Mr. Thomas Blashill remarked that nothing had been said that evening about brick bond. He had been looking at the drawings and photos exhibited to see if he could learn anything about the bond which was used in Germany, but he had not been able to do so, except in some where he found the whole face of the brickwork was in headers. What he wanted to look for was as to what was usually called "English bond," which was in principle the ordinary bond used over the greater part of the North of Europe. Flemish bond was often used here, although the construction was not so good, because of the better appearance it was supposed to give to a brick wall. But if gentlemen who travelled abroad would look at the brickwork used generally in the North of Europe, they would find there was an essential difference between the English bond used here and the bond of a somewhat similar character as used on the Continent. The difference was this: English bond was generally produced by making alternate courses of stretchers and headers. That did not make very good fine work, but in France, Belgium, Holland, and those parts of the North of Europe with which he was most familiar, they also used alternative courses of stretchers and headers, and in every course of stretchers they made the brick next the end brick, in alternate courses, the header. If gentlemen would look at the *Builder* for June 23, 1883, they would see a short paper, with illustrations which he gave, showing the difference. The effect was that the brickwork looked as well as the best Flemish work, and was very much better in construction.

Mr. Charles Fowler remarked that the old work was all Flemish bond.

Mr. E. C. Robins drew attention to the beautiful brickwork to be seen in Berlin, and to the very fine *façades* of some of the public buildings there.

The Chairman asked if the drawings could remain for some little time in the Institute rooms?

Mr. Strong said they could remain on view for a week.

The Chairman said that Prof. Otzen had sent

no fewer than 113 drawings, representing twenty-one public works, produced at a total cost of 180,000*l*. In England great advances had been made in producing beautiful brickwork, but we had to advance still further, so that our brick architecture should be enduring under the circumstances of climate and smoke. It was to be regretted that an entire evening had not been devoted to the subject, which was one of vital interest to English architects. It would lead, however, at a later period of the session, or next session, to some one introducing a paper which would go exhaustively into the matter, and say how the carving should be done.

The votes of thanks to Mr. Strong and Prof. Otaen were then carried by acclamation.

The Galilee of Durham Cathedral.

Mr. William White then read a paper on this subject. In the introduction Mr. White stated that Durham Cathedral was celebrated for its magnificent situation, its unusual type of architecture, and also for its Galilee, which was a perfectly unique structure. The name of the Galilee was as well known as the Cathedral, but not so its true meaning, or the purposes for which it was originally erected and used. The several and diverse traditions respecting it were not only at variance with each other, but no one of them accounted for certain architectural features found in it, or for its name. In many instances it had been called the Galilee Porch, the Galilee Chapel, or the Lady Chapel. The prevailing idea was that it had been built for a chapel; but the author considered that view untenable. Having given quotations from Canon Greenwell's history of the Cathedral, and Davies's history, referring considerably to Hugo Pudsey's connexion with the Cathedral, the late Joseph Gwilt's opinion was alluded to, as was also a paper by Longstaffe in the "Transactions" of the Archæological Society of Durham. The two first mentioned and the last wrote of the Galilee as a Lady Chapel; but Gwilt differed, saying it was for the "collection of monks returning from processions, and it was used for the dead bodies previous to burial." The separation of the Galilee from the church for the first 200 years,—supposing it had been separated, as some authorities considered,—certainly militated against the idea of its being recognised as a Lady Chapel. In an account of Durham Cathedral published by Ross in 1733, the Galilee was not said to have been built as a Lady Chapel; and from a MS. published by the Surtees Society one learnt that Cardinal Langley placed a font there for the baptism of children whose parents were under excommunication. After giving quotations of opinions and statements respecting the Galilee, including one that in the north side was an altar, called the Lady of Pity altar, dedicated by Cardinal Langley, reference was made to the origin and meaning of the word Galilee, which signified "circuit." It had been originally applied to the circuit of the country around Kadesh Naphtali, occupied chiefly by strangers. Mr. White considered that the Galilee at Durham took its rise from that association of ideas and circumstances, it being the court for causes extra-ecclesiastical. He believed that Pudsey built the Galilee as a court external to the Cathedral, though in contiguity to it, to serve not only as his Palatine Court, but also for his regal court of justice,—both criminal and civil cases coming before him as Prince-Bishop and Chief Justiciary under Richard I. Richard I. had, however, before leaving England for the Crusades, divided the country between two Regents, still appointing Pudsey Chief Justiciary for north of the Trent, and Longchamp, Bishop of Ely, for the south. Although there existed in England several so-called Galilee porches, there was but one besides Durham, that at Ely; and Ely had also been the see of a Prince-Bishop who was also a Chief Justiciary. The author then referred to Miller's, Bentham's, and Stewart's account of the Galilee at Ely, and stated that he had been told he was utterly mistaken in thinking a court would ever have been held in any part of a cathedral. But in ancient documents the Galilee at Ely was spoken of as "*Curia vocata le Galilee*," which, had it never been used as a court, was, to say the least, rather curious. The recess between the great central portal of the Galilee at Durham was the prominent feature, architecturally, which first led the author to the opinion that the Galilee was erected as a court. The arch was of Pudsey's date, and its treatment such as was consistent, at that time, with forming a recess for a tribune. The central division of the reredos was left with its rough plaster uncoloured, to receive a dorsal hanging or canopied seat, which was not the treatment of an altar reredos at that period. Reference to similar treatment in the old Church of St. James at Dover was made by the author, who regretted that while twelve or fourteen years ago he had seen traces of the original work, on a subsequent visit they had been covered with compo and completely obliterated. The term "Galilee" had been applied in several instances to a building attached on the west of a cathedral, as at Lincoln and Peterborough, and at the new chapel, Windsor, and St. Stephen's, Westminster. But whether in the first instance Galilees were built and used as courts or not, it was certain, he believed, that at Durham the Consistory Court had been held in the Galilee from the time of Cardinal Langley down to the end of the eighteenth century; while how early it might have been so used was unknown. In several village churches in England there was at the west end a porch or small chamber external to the church which had by some been called a Galilee. These he considered might likewise have been built for the purposes of a court,—although the actual purpose had never been definitely determined,—as the manorial courts, to which submission was made and fealties paid by the tenants, must have required some recognised public place. As examples were mentioned Melton Mowbray Church; Snettisham, Norfolk; Wigginton, Bucks; and Croyland Abbey. Besides those external chambers, in many churches there was a small chamber over the north or south porch called a parvise, the origin of which was equally uncertain, but which might have been intended to serve the same purpose. Or was it a narthex reserved for the penitents? At Cluny and Vézélay the author thought it was very probable that the thirteenth-century tribune was for some such purpose as he had indicated at Durham. In conclusion, he considered that, whatever their opinion as to the origin and uses of the Galilee, all would agree that there was yet enough interest about it, both archæologically and architecturally, to justify a record of its history.

In the discussion which followed,

Mr. Nicol said that in the Cathedral of Tuam, where there was a large choir, it was used as a court.

The Chairman: As a *curia*.

Mr. Thomas Blashill said he believed that at the east end of Durham Cathedral, as was the case with similar large buildings, there was originally a small chapel dedicated to the Virgin, and used only for the members of the community; and when in the latter part of the twelfth century the services offered with special reference to the Virgin became very popular, the people, and especially the women, desired to have the same privileges in a chapel to which they could be admitted. It was impossible that they could go through the portions of the church reserved for the community to the chapel which was built for them, and probably it became a question as to where the chapel should be built. Worksop Abbey showed, on the south side of the choir, a Galilee older than that of Durham, and having the large size and proportions characteristic of the thirteenth and fourteenth century Lady Chapels. The Durham Galilee was probably the next in date to that of Worksop, and he had no doubt it was originally built for no other purpose than that of a Lady Chapel. Another building, he believed, built for the same purpose, was that called the Chapel of St. Joseph of Arimathea at Glastonbury. These were built so that people might get at them, because they could not get at the chapels which existed at the east end of the cathedrals. At Hereford, Worcester, and other cathedrals, arrangements were made by which the people could go along the north aisle, and so get at the great Lady Chapels made in the thirteenth century to project from the east end. The great chapel at the east end of Durham Cathedral was the Lady Chapel, so that the building referred to by Mr. White would be no longer used as such, but might become the Consistory Court, or the Galilee, whatever that might mean. He was fairly familiar with the Church of St. James at Dover. That was made the court of the Lord Warden, but he believed it was not originally built as such, as there were all the marks of a purely ecclesiastical building upon the structure. In fact, it was only in comparatively late times that it became the Court of the Lord Warden. On the whole, then, he believed that the Galilee at Durham was built originally as a Lady Chapel, but when the eastern chapel was constructed it was no longer considered the Lady Chapel, and became the Galilee, although he confessed he could not tell the meaning of the name. He concluded by proposing a vote of thanks to Mr. White.

Mr. Wilson seconded the vote of thanks, and said that whatever the place was built for it had been all those things which had been described to them, and more; it had been a chapel, a court of justice, and a place of access for the female sex. The Consistory Courts had to move about, and they did not require more than a small amount of room. The courts, however, were held in some chapel or convenient place, where there was good access; but he had no doubt that this building was always the Chapel of Our Lady to the end.

The vote of thanks was then put and carried.

Mr. White, in his reply, said he had no doubt that such buildings were used for many purposes, and that the Consistory Court was moved to various parts of the Cathedral was a point as to which they need not raise any question. A civil court, on the other hand, would not be held in the Cathedral. Bishop Pudsey doubtless desired a place where he could hold his secular court, and it was not likely he would go elsewhere when he had the opportunity of making a court immediately contiguous to the Cathedral, but external to it. There was a precedent for that at the Cathedral of Aix-la-Chapelle, which contained a sort of Galilee where Charlemagne held his judicial courts, which were necessarily secular and civil. That monarch's chair was still preserved, he thought in one of the *triforia* in the centre of such a tribune as that which Viollet-le-Duc mentioned as existing at Vézélay.

The proceedings then terminated.

THE LONDON COUNTY COUNCIL.

The Blackwall Tunnel.—At the supplementary meeting of the Council held on the 14th inst., the question of the Blackwall Tunnel was further discussed, but no definite conclusion was arrived at, except that Mr. Arthur Arnold's amendment (the terms of which we have already given) was defeated by nine votes, the numbers being 56 against to 47 for. A further amendment, suggesting that the work should be postponed until the Council had obtained power to apply the principle of "betterment" to the land on Bugsby's Marshes which would be improved by the construction of the tunnel, was lost by 11 votes,—49 votes against to 38 for. The Chairman (Lord Rosebery) suggested as a compromise that a trial shaft and a small length of tunnel should be undertaken experimentally, and the further sideration of the question was adjourned until next Tuesday.

The usual weekly meeting of the London County Council was held on Tuesday afternoon last, Lord Rosebery in the chair.

Main Roads.—The Highways Committee's report contained the following important paragraphs:—

"Your Committee have considered the applications which have been made by the several Vestries and District Boards for thoroughfares in their respective districts to be declared by the Council to be 'main roads,' under the provisions of sections 11 and 41 of the Local Government Act, 1888, and the Highways and Locomotives (Amendment) Act, 1878. The la-t-named Act did not apply, so far as the provisions as to main roads were concerned, to London (in fact, the Metropolis was specially excluded by section 2 from the operation of the Act); but by section 41 of the Local Government Act, 1888, the provisions of the Highways Act relative to main roads were extended to London. Under section 15 of the Highways Act, 1878, the Common Council of the City, or any Vestry or District Board, if of opinion that any highway in its district ought to become a main road, by reason of such highway being a medium of communication between great towns, or a thoroughfare to a railway station, or otherwise, may apply to the London County Council for an order declaring such part of the road as lies within its district to be a main road; and if the Council be of opinion that there is probable cause for the application, it is to cause the road to be inspected, and, if satisfied that the road ought to be a main road, is to make an order accordingly.

All the local authorities in London, with the exception of the Court of Common Council and the Strand District Board, have exercised this power;

LIMITS OF HEIGHTS OF BUILDINGS.

We add the following statistics as to the regulation of heights of buildings in various German cities, to those which we have already given in a previous number (page 112 *ante*).

In Germany, the land of building regulations, we find that nearly every town of any importance has some rules referring to the height of the street front and the number of stories permissible, and these regulations are stringently enforced. It may be well to know that, for the sake of facilitating comparisons, nearly every town has set up a *ratio between height of street front and width of street*, and we have taken note of this fact in preparing the adjoining table:—

	Width of street (= b).	Maximum height (= h) of the street front of a building. (Height measured from highest point of footpath along the façade to top of front wall.)		Ratio of height to street width.	Roofs.	Number of stories permitted.	Remarks.
		Anywhere.	In the open.				
Munich.	(Measured between the authorised lines of building frontage.)	39 ft. 4 in.	74 ft. 2 in.	$h = b$	—	Five	Authority:—"Stadtbaumeister" T. Stuebben (Cologne).—Extract from statistics of the different sanitary police regulations of continental towns, as furnished by the "Fachgruppe für Gesundheits-technik" (meeting at Vienna 12th April 1889), for publication in the "Wochenschrift des Oestrr. Ing. u. Arch. Verein."
Dresden.		—	74 ft. 2 in.	$h = b$	—	Five. Only four if b is less than 82 ft.; only three if b is less than 55 ft. 9 in.	
Cologne.		37 ft. 9 in.	65 ft. 7 in.	$h = b$ + 11 ft. 6 in.	—	Four (as a rule)	
Bremen.		39 ft. 4 in.	—	If b = 19 ft. 8 in., then make h (max.) = b + 19 ft. 8 in.	—	—	
Duesseldorf.		32 ft. 10 in. minimum height	65 ft. 7 in. minimum height	$h = b$	—	—	
Erfurt.		24 ft. 7 in.	65 ft. 7 in.	—	—	Four	
Karlsruhe.		39 ft. 4 in.	—	$h = \frac{4}{5} b$	—	Five	
Stuttgart.		—	65 ft. 7 in.	$h = b$ + 14 ft. 9 in.	—	If the staircases are fireproof, any number. (Seldom more than 5.)	

and the applications received refer to thoroughfares of all descriptions, and in all parts of London, the total length of which, as stated by the Vestries and District Boards, is a little over 412 miles.

The circumstances of the main thoroughfares of London are so peculiar that your Committee have found considerable difficulty in applying the provisions of the section to the roads referred to in the applications. The thoroughfares of London can scarcely now be considered as means of communication between great towns, in the sense which is evidently intended by the Act; for, as the greater part of the goods and passenger traffic is now brought into and taken out of London by railway, there is very little of what may be deemed through traffic by road between great towns on either side of the county; while, with so many railway stations in London, nearly every road and street may be considered to be a part of a thoroughfare to a railway station, and so would answer the description in the section. Your Committee may also point out that the extra cost of maintenance caused by traffic passing through a main thoroughfare from one London district to another, or to and from a railway station, is probably more than met by the increase in the rateable value of the property consequent upon the road being used for either of those purposes.

The Local Government Act casts upon the Council the duty of maintenance of any thoroughfare declared to be main roads, but the local authorities may claim to retain the management, &c., of such roads, and in that case the Council is called upon to pay the cost of such maintenance, without any power being given to the Council to exercise control in any way as to the manner in which the road shall be dealt with. Thus, in the case of a main road running through several parishes and districts, a part may be paved with wood, another with granite, another with asphalte, and yet another part may be macadamised, at the will of the respective local authorities; but the Council, on the report of its Surveyor that each part of the road has been properly maintained and repaired, will have to pay a sum, to be agreed upon from time to time, for the cost of maintenance, without having any power to direct that the system of maintenance of the road shall be uniform throughout its entire length. This appears to your Committee to be an arrangement which requires some alteration, either in the direction of relieving the Council of its responsibility, or, if such responsibility be retained, of giving the Council some power of control over the manner in which the money is to be expended, and of requiring continuity in the system of paving or otherwise to be adopted with regard to the road.

The question whether a road has been maintained in a satisfactory condition, which must be decided each time before the Council's contribution is paid, would probably give rise to constant friction. In the case of a road passing through several parishes, the work of repair and maintenance in one district may have been done to the satisfaction of the Council's Surveyor, while in the adjoining parish the work may not have been satisfactorily performed; and should the Council require any particular standard of maintenance to be observed, as a preliminary to the payment of its contribution, great dissatisfaction might arise.

The Local Government Act provides (section 11, sub-section 7) that where the Council declares a thoroughfare to be a main road, such declaration shall not take effect until the road has been placed in proper repair and condition to the satisfaction of the Council. Some of the Vestries and District Boards have expended considerable sums in putting the thoroughfares in their districts into a state of proper repair, which sums have been borrowed on loan, and are in course of repayment; but in some districts where the roads are not in good condition, the expenditure before the declaration of the Council could take effect would probably be very large, and it might be a hardship to compel local authorities to embark at very short notice on an expenditure which they had not contemplated, and which might interfere with the carrying out of other and more pressing requirements. At the same time, it would be manifestly unfair to the other districts of London if the Council were to accept the responsibility of the cost of the future maintenance of roads which were not at the first in good and proper condition.

Under the Local Government Act, the duty of maintaining those roads in the County of London which have been disturnpiked since December 31, 1870, devolves upon the Council; but the local authorities have the same power of retaining the management of the portions of these roads in their respective districts, as in the case of roads to be declared by the Council to be main roads, and the Council is to make a payment towards the cost. Your Committee have found considerable difficulty in interpreting and reconciling the provisions of section 11 and the subsections thereof in the Local Government Act. Sub-section 1 casts upon the County Council the duty of wholly maintaining the existing main roads; while sub-section 2 provides that in case a local authority shall claim to retain the powers and duties of maintaining and repairing the roads within its district, it shall thereupon be entitled to retain the same, and the Council shall make an annual payment towards the cost of the maintenance and repair; and sub-section 4 gives the Council power to require a local authority to retain the management of a road in consideration of an annual payment by the Council for the cost of the undertaking. Your Committee have taken the opinion of counsel upon the question of the meaning of the words 'towards' and 'for,' as used in these sub-sections, but have not been able to arrive at any definite conclusion upon it.

Upon a review of all the circumstances your Committee are of opinion that the provisions in the Local Government Act and the Highways and Locomotives Act, with reference to main roads, are totally inapplicable to the thoroughfares in the County of London, having regard to the peculiar conditions under which they are managed, and the number of authorities concerned in such management. Your Committee therefore recommend—

"That the Government be requested to take the necessary measures for the amendment of the Local Government Act by exempting the County of London from the operation of sections 11 and 41 (4) of the Act; and that the President of the Local Government Board be requested to receive a deputation from the Council on the subject.'"

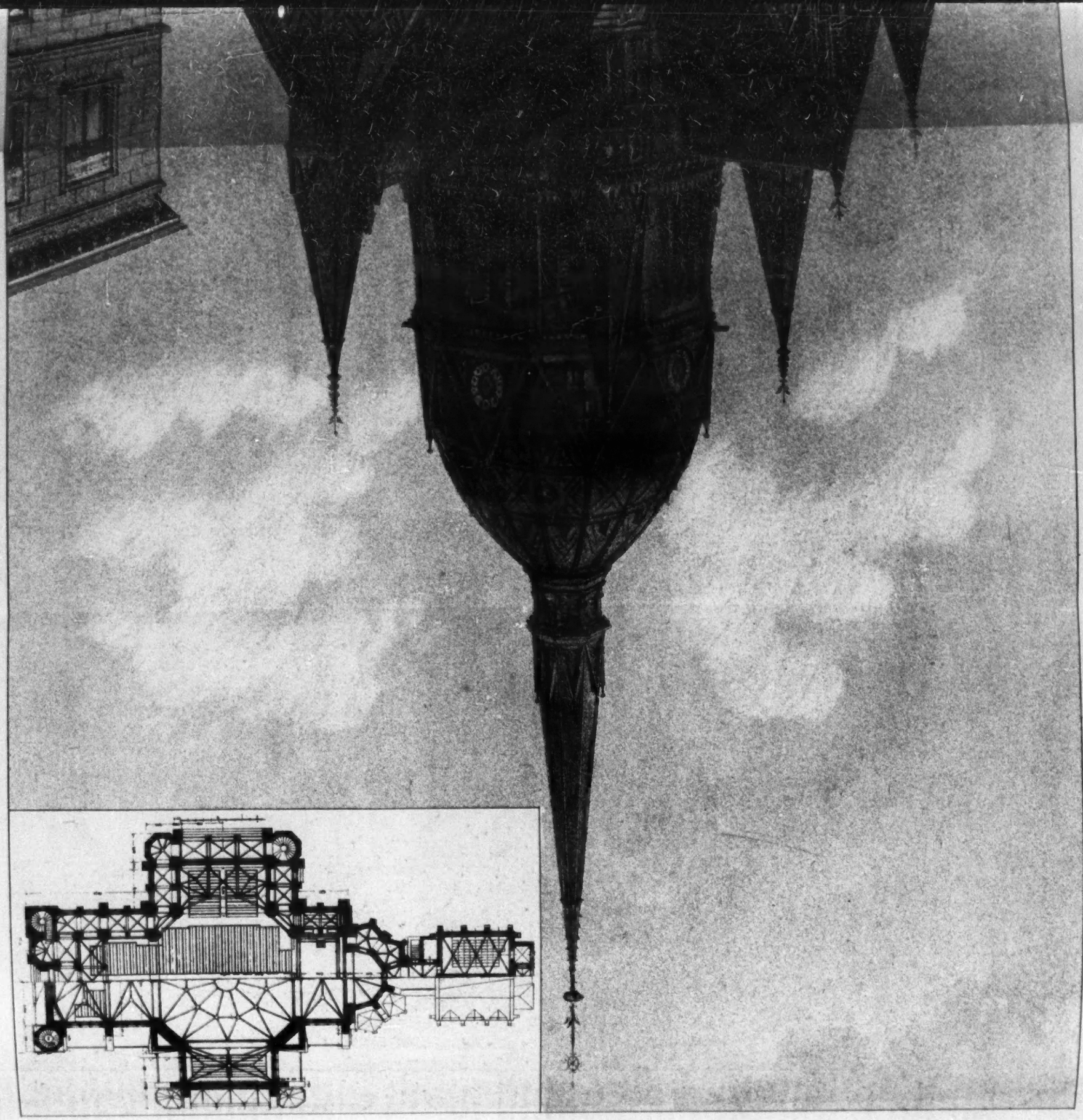
After some discussion, in the course of which Mr. Westacott cited figures showing that the cost of maintaining main roads in the metropolis averaged 1,000*l.* per mile, which would mean an expenditure of 412,000*l.* for the 412 miles mentioned in the report, the recommendation of the Committee was agreed to.

District Councils.—On the motion of Mr. A. Hoare, it was resolved,—

"That in the opinion of the Council it is a matter of great urgency in the public interest that District Councils should be established in London."

After transacting some further business, the Council adjourned.

The English Iron Trade.—There is a partial recovery in the English iron market, at least so far as pig-iron is concerned, but the business doing is still limited. Whether the coal strike now in full operation will last long or not—and there are some who predict that it will be of brief duration—its effects have been the unsettlement of trade, and the stoppage of many works. The north of England and Scotland not being affected by the strike, it is there we observe the recovery of the market. Scotch warrants have had an upward tendency all the week, and the price of some Scotch brands has been slightly raised by makers, while Cleveland iron has advanced from 1*s.* to 1*s.* 6*d.* per ton on the week. In the districts subject to the cessation of work by the miners, prices of pig-iron show weakness. North-west makers of hematite have again reduced their quotation, this time by 2*s.* a ton. Very little is doing in finished iron and steel, and present quotations for the former are scarcely maintained. Steel rails are weak at 6*l.* in the north-west, and this is now also the price of blooms, billets, and slabs. Shipbuilders are beginning to experience more enquiry, while engineers, where they have not been compelled by the want of fuel to restrict operations, continue fairly busy.—*Iron.*



Illustrations.

BUILDINGS DESIGNED BY PROFESSOR OTZEN, OF BERLIN.

WE have given in this number reproductions of some of the drawings by Professor Otzen which have been exhibited at the Institute of architects this week in connexion with a paper on the subject by Mr. A. Strong, with the double object of illustrating the paper, and of giving our provincial readers a selection from the drawings which have been exhibited to London members of the Institute.

The general subject is sufficiently discussed in Mr. Strong's paper. The section through the Eimsbüttel Church shows a powerful piece of work of its class, and is an example of a somewhat elaborate interior church architecture carried out in brick, with diaper surface ornament in various portions of the wall.

The style of Gothic design illustrated in the exterior of the Church of the Holy Cross, and in the reredos from a church near Wiesbaden, it is needless for us to say, is not such as is likely to meet with much favour or admiration among English architects; but it represents the class of work which is being carried out by an architect of distinction in his own country, and we presume therefore that there is a considerable population to whose tastes it appeals, which is an important fact not to be overlooked.

In the Flensburg church the spire alone is modern and the design of Herr Otzen; we selected it partly because the spire is a good example of its class, partly because the whole makes rather a pleasing and characteristic picture.

MODERNISM IN ART.*

IN a paper which I had the honour of reading at the Arts and Crafts Exhibition Society, recently, on "Stained Glass," I had occasion to deplore the pedantry which still enervates and depresses so much of our decorative art; and feeling, as I do very strongly, that no art is genuine which is not modern in the sense of expressing the best of which the artist and his age are capable, I was moved to make this the subject of the paper which you kindly asked me to read to you to-night.

But there is a wide difference between the incidental reference to a question like this in its bearing on a particular technical art, and an independent examination into the question itself.

I should be shirking the responsibility I have undertaken if I contented myself with an hour's jeremiad on the lack of vitality in our present day art, instead of attempting to account for it, and, if possible, to indicate a remedy.

Now what does this enquiry involve? I suppose none will deny that pedantry is an evil in art, as in everything else; that the only art worthy of the name is the work of men who speak their *own* minds,—not of men who pretend to be somebody else, and make a ludicrous attempt to say not what they themselves feel, but what they think somebody else would have said. But, if the thing is so manifestly absurd, how comes the evil into existence?

Here, then, is the first stage of our inquiry. What is the true cause of pedantry in art? The proximate cause is obvious. It is the lack of vitality in our artistic powers, the paucity and poverty of our ideas. No one borrows money who has a large capital of his own, and no one borrows ideas who has a wealth of them within himself clamouring for utterance.

But this answer merely leads us to the next stage. What is the cause of this low vitality? Is man going irrecoverably down-hill? Is the deadly monotony and hideousness of our streets, our costume, our furniture inevitable and permanent, or is there some assignable and sufficient cause? And, if so,—finally,—Is the ultimate cause one which we can reach? Can we, by getting at the root, restore health to the tree?

To me these questions appear to be the most profoundly interesting to which an artist can address himself. Till they have been answered all others seem by comparison to be academical. They concern our life, others concern the outward form which will take care of itself when life and health are restored,—if restored they can be.

I have long and anxiously considered the subject myself and see no reason to despond as to an ultimate solution; no reason to suppose that the destitution, the vulgarity, and the squalor which desolate the everyday life of this age must endure and are without remedy. So long as we are aware of the evil and chafe under it, there is hope.

The unqualified satisfaction of the prosperous money-maker who comes from his office and ledgers to a home crowded with expensive articles not one of which possesses a trace of beauty,—this is indeed a depressing subject for contemplation, but happily this state of mind is not universal. There are many who deplore the ugliness of our life and some who attempt to improve our condition.

You all know Watts's pathetic picture of "Hope." Well, this discontent, this struggle against the flaunting finery, the graceless luxury of our rich, and the crushing, brutalising misery of our poor, is the one string to our lyre, the still, small voice which must ultimately prevail.

Let us, then, with the courage of a true faith in the immortality of beauty, face the evils that beset us; let us see what they are, and whence they arise, for only so shall we be prepared to overthrow them.

First, let us contemplate this pedantry, this substitute for art which is the resource of those who have nothing to offer of their own. How came men to utter this base coin, and how came men to accept it when offered? Well, we all know how the Pugin movement began, and I take this as a very favourable instance, recognising that ecclesiastical architecture stands in many respects alone, that it embodies an ancient tradition, that it has not to meet requirements of an everyday life varying with each generation, that its conditions of existence being totally unlike those of domestic architecture, the principles which apply to one do not necessarily apply to the other.

It is not, therefore, by way of pronouncing an adverse opinion on a movement concerning which any one of you have a better right to speak than myself, that I refer to this episode to indicate how and why a course which may be necessary though regrettable in one case is followed in other cases where it is wholly objectionable.

It is long since I read Pugin's well-known comparison between Georgian and Mediæval architecture, but I recall the amusing examples he gives, and his argument is a simple one: This is hideous, that is exquisite; why will you put up with this when you can have that? Whether the alternative was what Pugin thought, whether we could have "that," or only a lifeless imitation of it, I leave to architects to decide. Where we are dealing with forms only remotely, if at all, derived in any sense from nature, with mouldings and cornices, shafts and caps, arches and groinings, their beauty consisting chiefly in proportion, it appears to me that an artist with a fine sense of proportion may produce and has produced works noble and impressive, though the forms in their details were borrowed from a past age. In any case there can be no doubt that the movement originated in a sincere love of beauty, and this I readily admit, though, as the lawyers say, "without prejudice"; but when we come to figure-decoration the whole question is altered.

On this the movement had a most baneful influence. The revived admiration of Mediæval, and particularly thirteenth-century, architecture, having become general, it was swallowed whole with all its accompaniments with a total absence of thought and discrimination that speaks volumes for the prevalent tastelessness of the time. A thirteenth-century stained-glass window or missal exhibits commonly a power of design, a splendour of colour, and a vigour of imagination and symbolism which may well excite our wonder and envy. What effect had these windows on the commercial decorators in the early days of the Gothic revival? They saw nothing of the beauty of colour of design or of imagination. One thing alone they aimed at (to judge by their results).

Draughtsmanship in the thirteenth century was in its childhood. The figures in the best works of that period possessed a surprising vigour and spirit, but the technique was imperfect. Here was the thing to be imitated. Colour was of no consequence: the rawest and crudest that could be found would do; but a splay foot and a goggle eye would place the work at once on a par with an Early English window. I should apologise for even referring to these babyish productions, were it not for the extraordinary fact that notwithstanding all the great advance which has since been made in the quality and colour of the material, there are still respectable decorative houses who imitate the decorative works of the thirteenth, fourteenth, and sixteenth centuries, and seem to think they are producing works of art. Not only so, but there are people who gravely accept this base coin as legal tender, and treat these travesties of genuine work as if they had anything genuine about them. Happily they are exclusively commercial productions. Art has not got so low even in this age that an artist will descend to servile, avowed imitation of other men's ideas, designs, and even mannerisms, still less to imitate those of other ages. Nor is it expected that he should do so—outside a church. His powers may be great or small, his range of thought and conception high or low, but he is expected to give us the best he has of his own, expressed in the most perfect manner of which he is capable. A lofty soul will speak to us at our best, and will elevate that best of ours to something better. A soul of lower range may address our lighter moods, but each in its own plane may be as perfect as the other. If these that speak to us be true prophets, and have aught to say that is worth saying, they will spare no pains to see that their message is not marred by clumsiness of utterance. They will attract us by the excellence of their speech, and then move us by the worth of what they have to tell.

While writing this sentence, a paper was put into my hands, which I opened at these words: "To touch the heart of his reader, an author must coin his soul into words." Most true, and well said. Even so a painter must coin his soul into visible images, else he will certainly touch no hearts, and he must see that beautiful thoughts are coined into beautiful images worthy of that which they express.

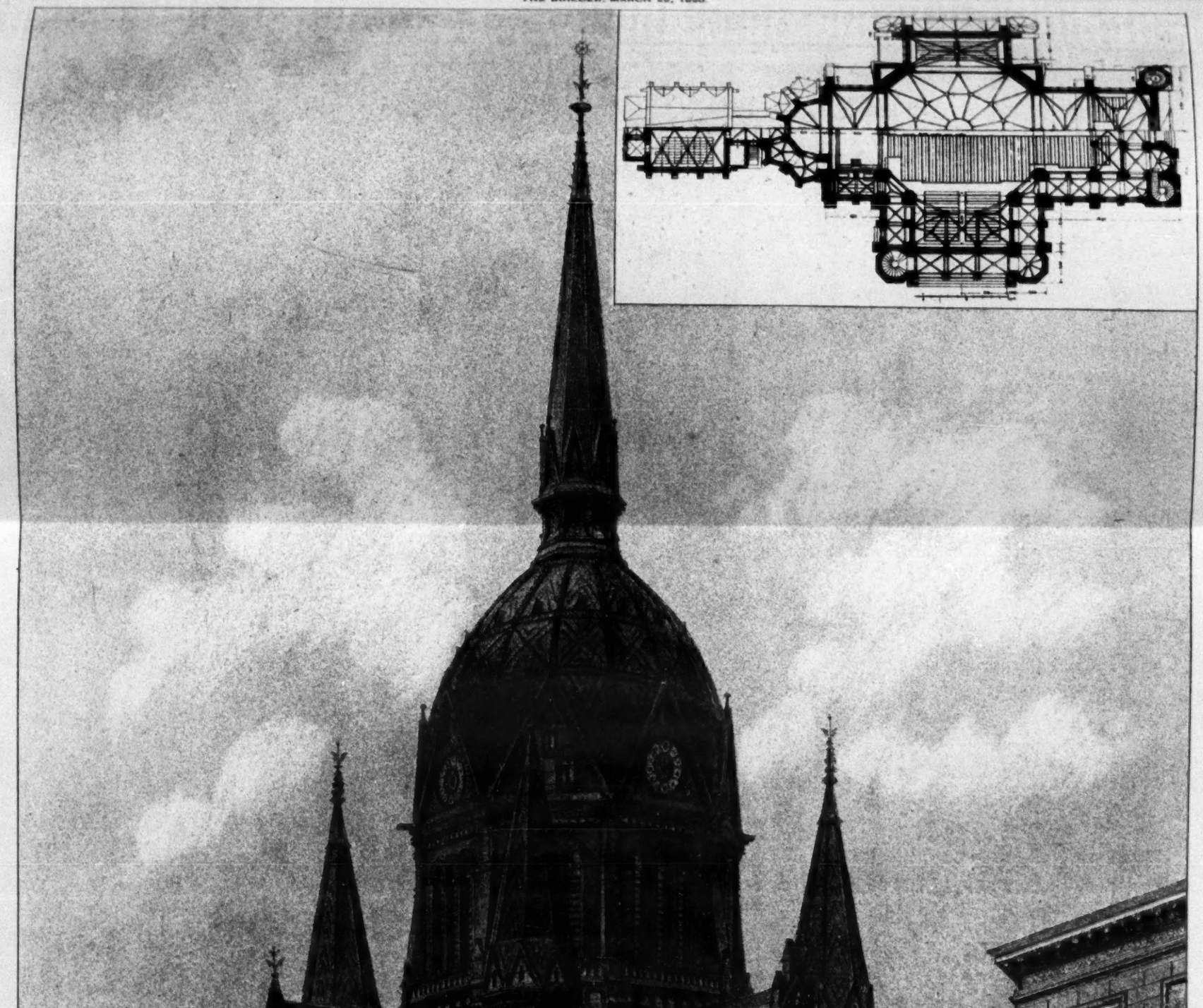
Something like this we ask for elsewhere than in a church. We do not always get it, but we often do in greater or less measure, and we value the giver in proportion as he fulfils our desire. A Watts, a Walker, or a Leech address different natures or different moods of the same nature, but each gives us of his own, and gives something that no one else can give. Whether we weep with those that weep, or laugh with those that laugh,—soul speaks to soul, heart responds to heart. But, inside a church, what have we to do with souls and hearts? There we are only concerned with thirteenth century or fifteenth century; all we want there is a commercial firm who can coach its *employés* in the correct thirteenth-century goggle eye or the fifteenth-century wrinkle, and in all the other tricks of the trade, by which the expert may know what period is being caricatured for his benefit. In the true work of art, where the *technique* is but the means of expressing ideas which had insisted on utterance, we respond to the influence of a master. In the hollow substitute for art where the *technique* is but a mechanical imitation of something else, we find nothing but the drudgery of a slave, tied down to a dull routine, on whom we can hardly even bestow compassion, for he parades his servitude with evident satisfaction.

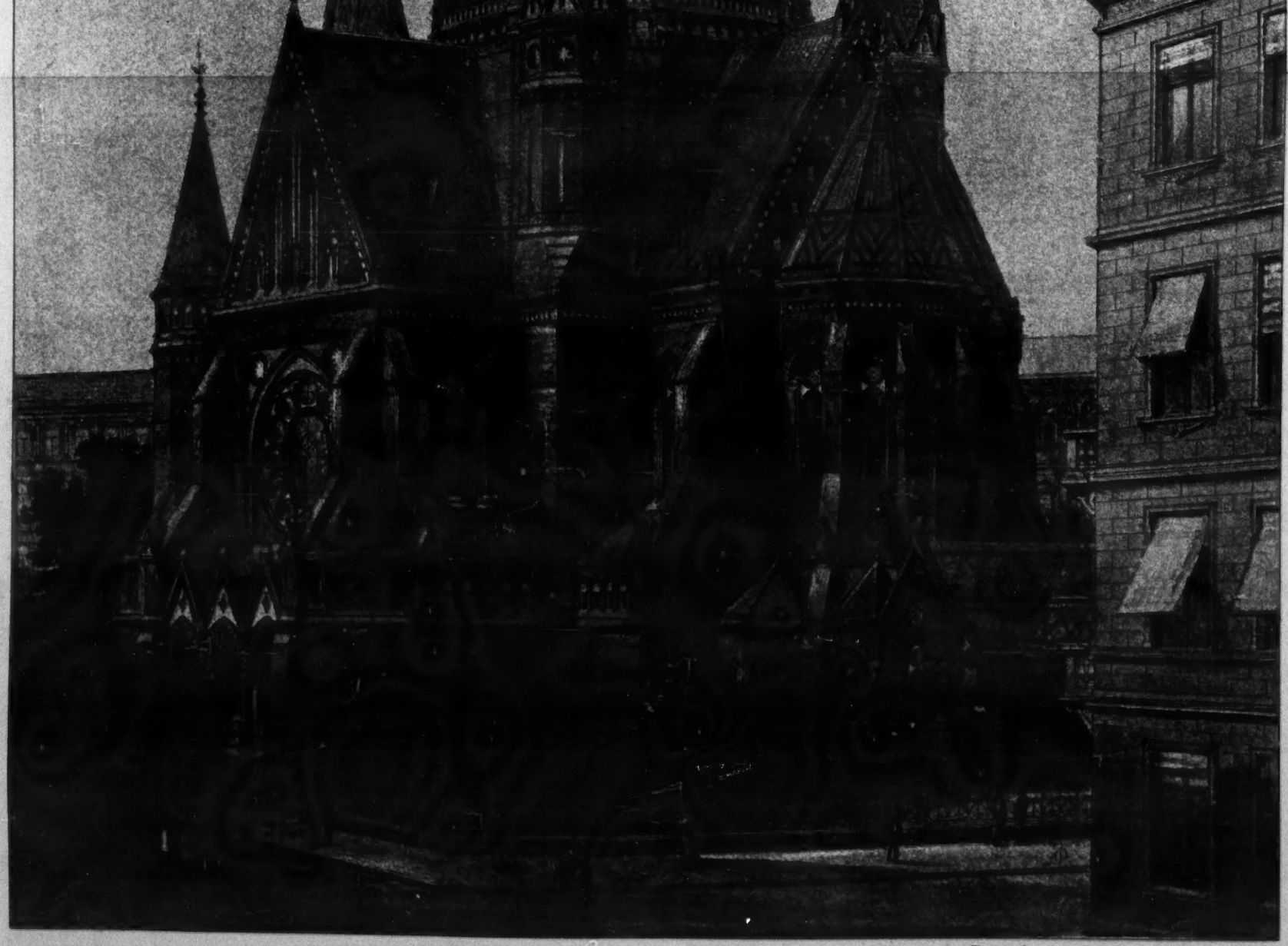
Surely it ought to be a truism to say that all genuine art was modern when it was produced; in no past age did men try to make their work appear to have been produced in an earlier age, and, except in decorative art, it is rarely done now. A man who would send a picture to the Royal Academy imitating all the mannerisms of Giotto would be laughed at. It would be considered idle to allege that Giotto was a great genius; that would be a reason for admiration, a reason for going to him for lessons in nobility and simplicity, but not for servile imitation of his drawing, his perspective, his light and shade, and his manner, not for the violation of every principle which he maintained. For if there is one quality which distinguishes Giotto more than other, it is his intense modernism, the daring with which he broke away from the formality of the Byzantine artists, and asserted his right to say what he himself felt, refusing to be the slave of a tradition, even though that tradition was in force, not an artificially resuscitated style, ignored by every artist of the day.

If this pedantry is absolutely indefensible on any rational artistic principle, how comes it to be permitted in any branch of art?

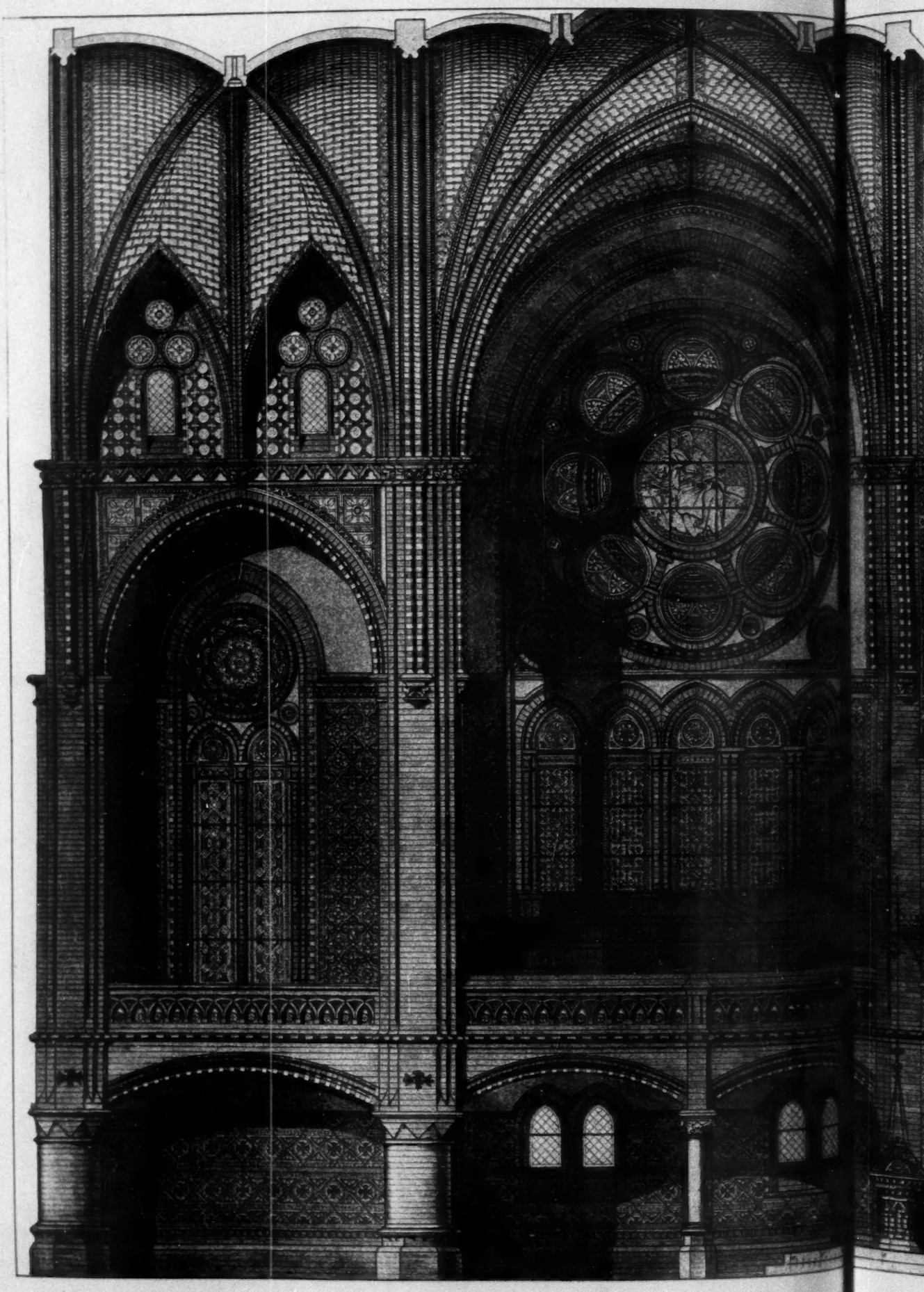
If modernism is the characteristic of all the

* A paper by Mr. Henry Holiday, read by him to the members of the Architectural Association on the 14th inst., as elsewhere mentioned.





THE CHURCH OF THE HOLY CROSS AT BERLIN.—Professor J. Otzen, Architect.



CHRIST CHURCH, EIMSBÜTTEL, NEA[illegible]MBURG.—Pro[illegible]
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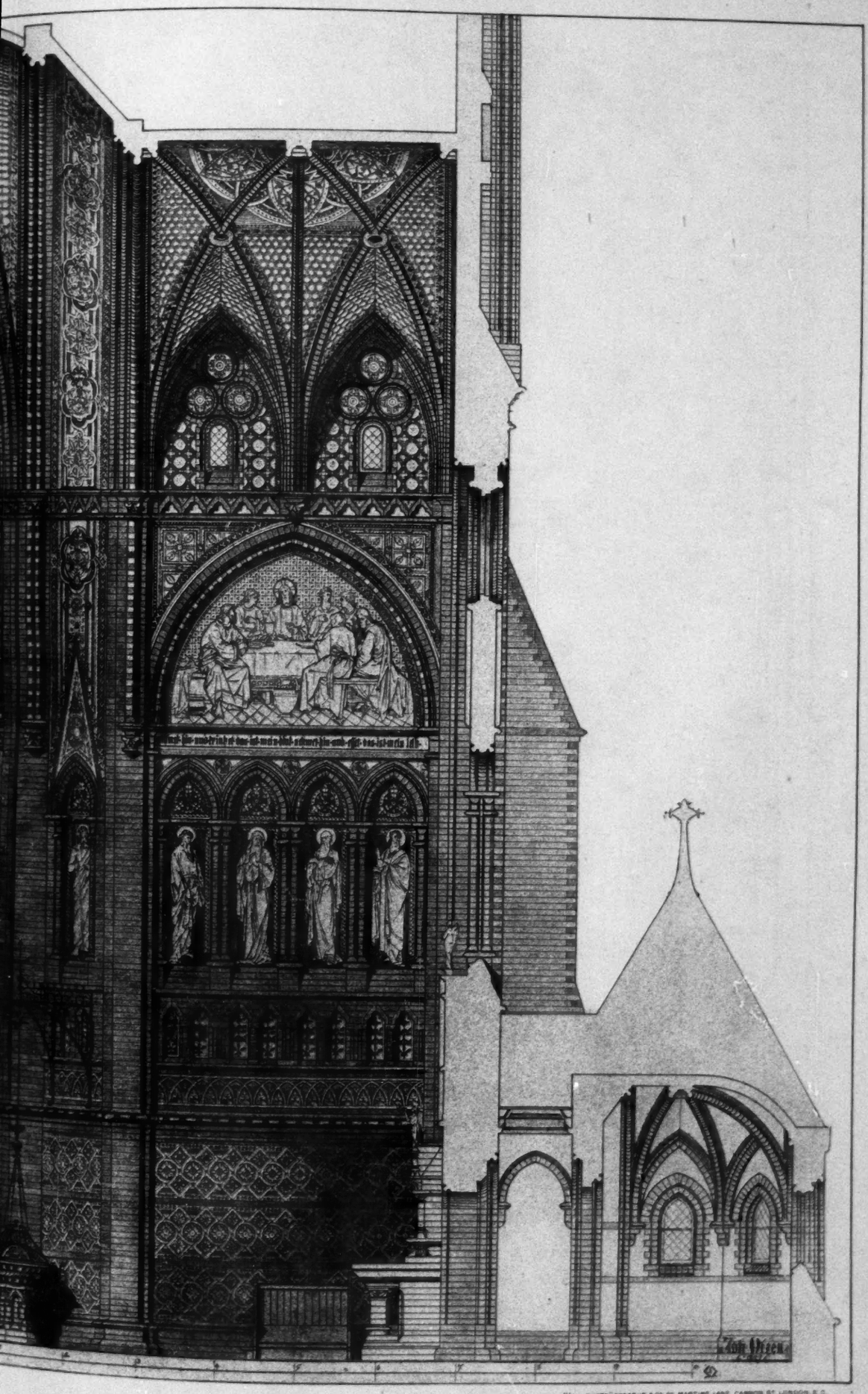

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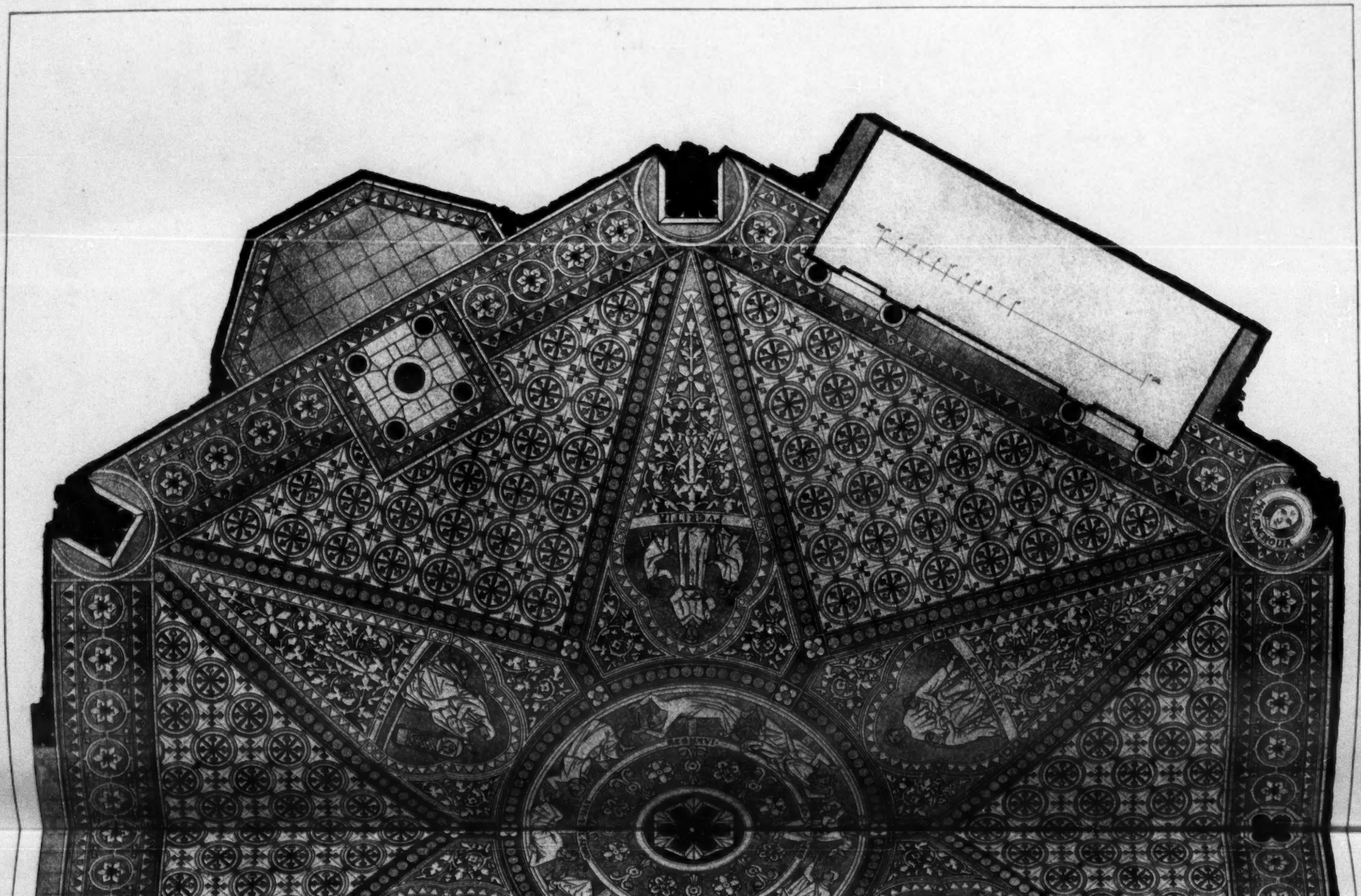

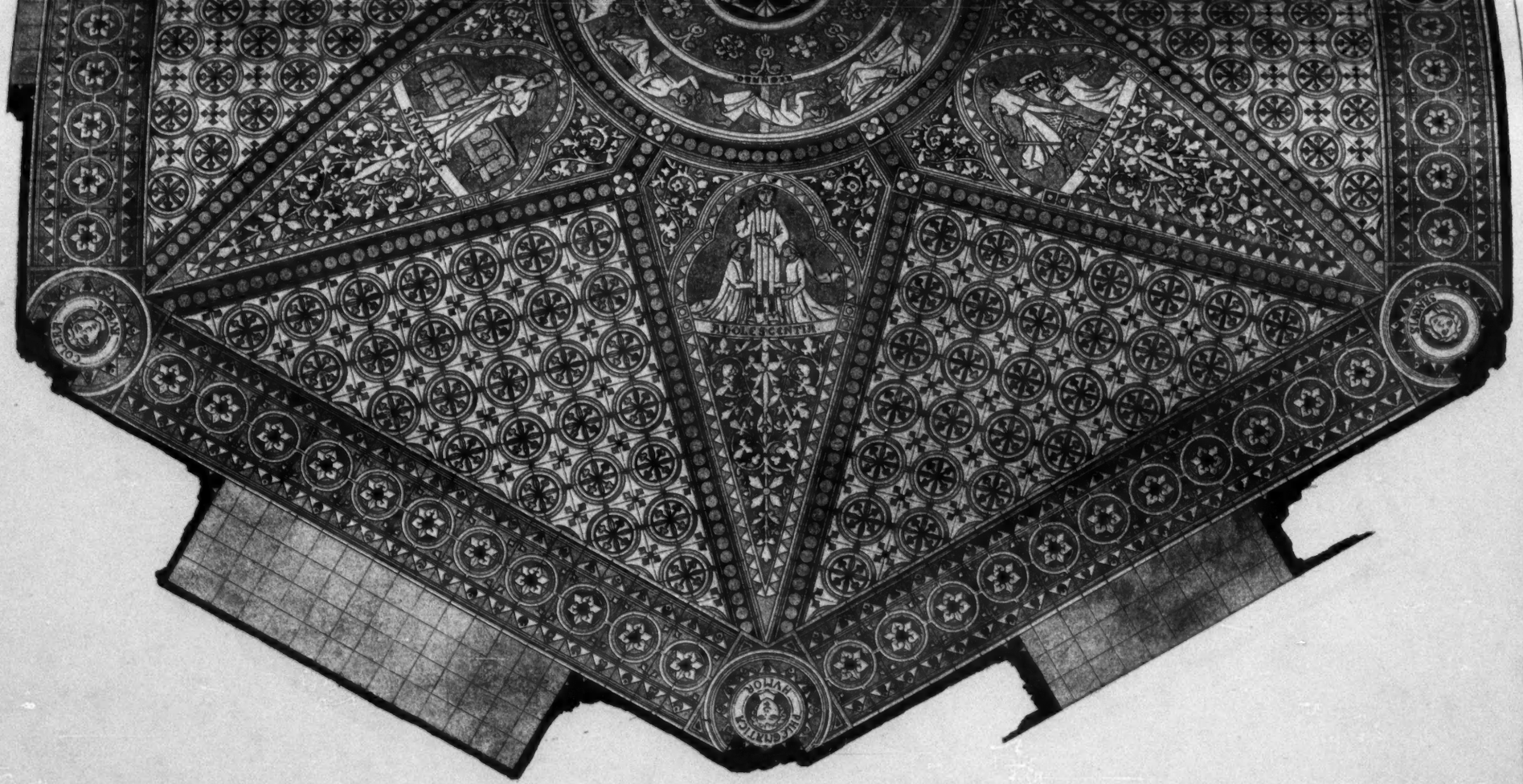

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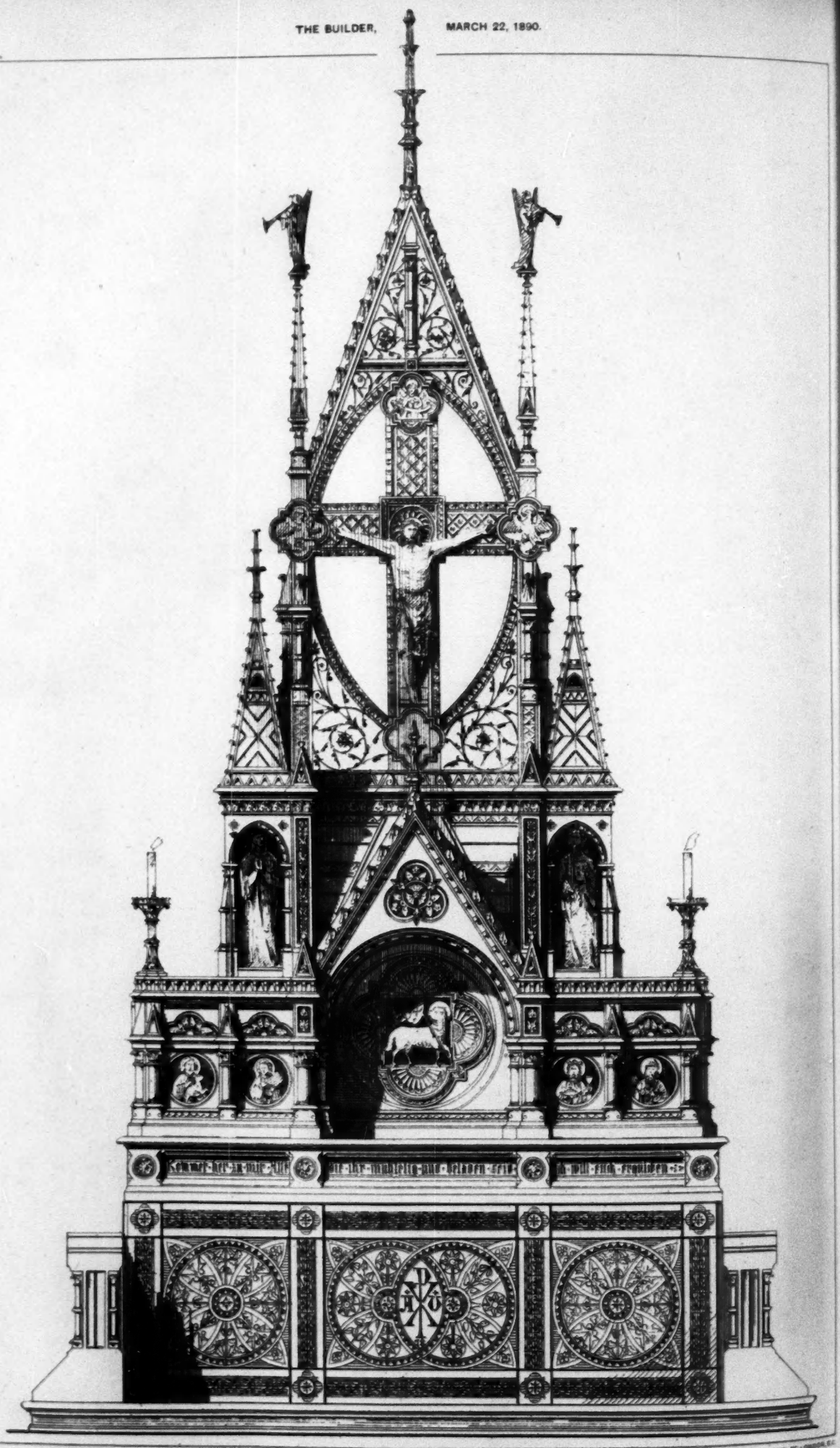
PLAN OF PAVEMENT, JUBILEE CHAPEL, BERLIN.—Professor J. Otzen, Architect.



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ALTAR AND REREDOS, "MOUNTAIN" CHURCH, WIESBADEN.—Professor J. Otzen, Architect.

ST. NICHOLAS CHURCH, FLENSBURG: SHOWING MODERN SPIRE.—PROFESSOR J. OTZEN, ARCHITECT.

best art of other ages, if we are most moved by the Giottos, the Botticellis, the Signorellis, the Veroneses of the past, by all those, in fact, who expressed and led the sentiment of their respective ages, why do any of us now regard childish imitations of a past age with anything but the contempt which they deserve and which they would have received at any other period?—if such follies can be conceived as existing in any other period.

Unhappily the cause is only too obvious: the *cause*, I say, not the justification. The poverty of the art of to-day is the reason why we pilfer from that of the past. Poverty does not justify theft, but it is poverty which makes men thieves; and it is only in our artistic poverty that I can find any means of accounting for the prevalence of that which, to me, is the greatest of artistic crimes; for under this vicious system we are training young draughtsmen into systematic deceit, and crushing every better impulse, every genuine faculty which they may have possessed when starting. I have seen men whom I knew as students, and who were then doing hopeful work, go to one of these commercial houses, and there by degrees I have seen every faculty gradually blighted till no trace of any artistic perception remained. The method which originated in poverty ends in the destruction of what little we possess. If our artistic vitality is weak, this is the laziest and the most demoralising course we can adopt. If we are poor the simulation in our outward style of a wealth we do not possess will with absolute certainty land us in a disgraceful bankruptcy. Better by far be content with a modest confession of our small means, and work hard like honest men to improve our condition, than make a false show with other men's goods.

So much I must say in strenuous protest against the demoralising principle that pedantry is justified by the feeble vitality of the artistic sense under which our age suffers; but now as to that weakness itself, what is its nature and extent? Is it merely that our decorative sense is imperfect? Is it merely that we are in the trough of the artistic wave and may in another generation or so be on the crest? We all know that in painting, in poetry, in music, and in science there are waves which pass over nations, an art rising for a time to a towering height, and then sinking out of sight, or to vary the metaphor the great luminaries in any art are usually found in constellations connected with each other only by a few sporadic stars.

Is this all that is the matter with us? That genius is not so plentiful as in some other periods, but may become so again in the near future? I venture to say our case is much worse than this. It is not that geniuses are few—they may or may not be—but that society is corrupt, that the conditions under which we live are conditions under which art cannot possibly thrive.

What we are concerned with is not paucity of geniuses, but the almost total absence of art in our present daily life, and the question we have to answer is, "What is there in our present condition which so stunts and suppresses that love of beauty which in every other age has been one of our dominant impulses?"

I will read you a passage written some twenty-five years ago by an acute observer and profound thinker on the motives which influence modern society. John Stuart Mill is not speaking of art, but his description throws floods of light on the subject of our inquiry:—

"The acquisition of wealth was invested with a factitious value, independent of its intrinsic utility. It became synonymous with power; and, since power with the common herd of mankind *gives* power, wealth became the chief source of personal consideration and the measure and stamp of success in life. To get out of one rank in society into the next above it is the great aim of English middle-class life, and the acquisition of wealth the means. And, inasmuch as to be rich without industry has always hitherto constituted a step in the social scale above those who are rich by means of industry, it becomes the object of ambition to save not merely as much as will afford a large income while in business, but enough to retire from business and live in affluence on realised gains. These causes have in England been greatly aided by that extreme incapacity of the people for personal enjoyment which is a characteristic of countries over which Puritanism has passed. But if accumulation is, on one hand, rendered easier by the absence of a taste for pleasure, it is, on the other, made more difficult by the presence of a very real taste for expense. So strong is the association between personal consequence and the signs of wealth that the silly desire for the appearance of a large expenditure has the force of a passion among large classes of a nation which derives less pleasure than perhaps any other in the world from what it spends."

Now I would ask you in the light of this passage to consider that depraved taste, the predominance of which we deplore. What Mill well designates "the silly desire for the appearance of a large expenditure," on account of the consequence it gives us in society, causes us to surround ourselves with *finery for the sake of display*, instead of seeking *beauty for the sake of enjoyment*. Let us look around for a moment and note the almost total absence of art in our present daily life.

It is admitted on all hands. It is a matter of constant discussion. There are many clever and some noble works of art produced still, that is to say, there are still men, who having made art their profession from a genuine impulse, produce works which possess beauty, and sometimes noble thought, but outside these isolated cases where is the art of our daily life, the art in our houses, in our furniture, in our dress, in all our utensils, and in nineteen-twentieths of our pictures and statues and buildings? Whence arises that deadly uniformity, that depressing, all-prevailing grayness—but that is too flattering a term—that all-prevailing dinginess which fills our life, so far as its external conditions are concerned, and has filled it throughout this century? Here and there a few educated persons are cultivating taste in form and colour as an exotic, but as a spontaneous growth it is gone. Whether we look at the earlier, middle, or later years of the century, we find the same thing. If we walk down Gower-street, Westbourne-terrace, or Cromwell-road, we look in vain for a gleam of taste, for a glimpse of anything that can charm the eye or refresh the mind.

Interminable rows of identical houses all cut down to one common type—mindless, joyless. Slaves in chains must have built them; nothing else can account for the gloom which they betray and produce.

Ornament there is, ghastly ornament, all done to order under heavy penalties, all alike, all representing—what?—the pleasure of the worker in fashioning it? Good heavens, no! It is done by machinery. It represents what is expected of the class of society to which the owners of the houses belong, or wish to be thought to belong. Let us now look at dress. Here, surely, there will be more freedom. Cannot the individual assert his personality here? Let us see. Here is a train arriving at Moorgate Station full of well-to-do citizens going to their daily avocation. We can note the charming variety of form, colour, and material which is the natural expression of that individualism we all prize so greatly. But what is it we see? All dressed exactly alike,—they must then certainly have found a type of dress so beautiful, so perfect, that they have voluntarily surrendered their individualism as a tribute to that perfection which cannot be excelled. Is it so? Are these black, cut-away coats, these black boots, these cylindrical tubes of trowsers, these black top-hats, are these the ideal for which all individuality is to be sacrificed? I heard a critic of Mr. Bellamy's "Looking Backward" deprecate the orderly organisation of the system he describes with the remark that under such a routine people would be like sheep. What are these like? Rather black sheep. Gloom and the total absence of individuality are the characteristics of our system. And why this deadly uniformity, this total absence of anything to show that the wearers of these clothes, the dwellers in these houses, are anything but automata, all made to order, like the hideous and barbarous things they wear and live in? Are they all alike?

Talk to them in their offices and you might almost think they are; but know them intimately, and you soon find the widest differences. Why, then, cannot they show that they are thinking, rational beings, possessing here and there a stray idea of their own? Are they slaves, or what does it all mean? Yes, they are slaves, all working in chains crushed under the tyranny of two relentless Molochs, the great god Profit and the great god Snob. These two have chained up individuality and trampled her under foot. Beauty they have expelled from Society (with a big S). There are one or two sanctuaries where she is still allowed a refuge, and the very few who are ever allowed by the god Profit to have a spare hour occasionally visit her; but if she appears in the street, the god Snob hoots her and tramples on her.

Each have their own weapons and instruments of torture. Some of the victims of Profit suffer so grievously that they dare even to make a show of resistance. But it is futile and short-lived. He has two clubs, called Supply and Demand, and these he swings about mercilessly, and the wretched slaves are soon cowed.

Occasionally a feeble protest is made by those who groan under the rule of the god Snob; but he also has too clubs—Respectability and Social Status. At the mere sight of them down go the slaves prostrate before their relentless idol.

And meantime poor Individuality is wasting away in her prison.

Alas! what can art do without individuality? They are inseparable, each without the other must languish. Society has taken up that liveried drudge, Ostentation, and Art must keep her lonely state in a National Gallery while we are the slaves of slaves.

The jerry-builders and the fashion-books are the slaves of the gods, Profit and Snob, and we are the slaves of the jerry-builders and the fashion-books.

But still we have only got half way in our inquiry into the ultimate cause of our almost extinct love of Art. If the views I have advanced are so far sound, we have attributed the decay in our love of beauty to the growth of our love of social status, our "silly desire for the appearance of a large expenditure." But why should we substitute the base desire for the pure now any more than our ancestors of two, or three, or six centuries ago? So far we have only shifted the inquiry one step further back. If this degradation is the effect of external conditions, what are the conditions which affect us and which did not affect our ancestors?

I have hinted by references to the god Profit that they are industrial conditions, but men worked for wages and bought and sold for profit in these past centuries. Profit may not be an elevating aim in life, but it cannot be a differentiating factor between the present age and those in which Art flourished, not merely as the cult of a few, but as a daily part of the life of all.

What, then, is that differentiating factor which has destroyed all the beauty and picturesqueness say of a London street in the fourteenth century, with the variety and charm of its buildings and its costumes, and given us in its place the deadly monotony of Bayswater and the pot-hat?

In my opinion this differentiating factor is the intensity of the struggle for existence in our present crowded populations. That men should live by giving as little and getting as much as they can in every transaction of life was bad in former ages as now, but the pressure was so much lighter that it was, happily, quite unable to crush that buoyancy of spirit which impelled men to seek beauty in all their surroundings. Now, the pressure, instead of being just sufficient to produce a healthy emulation and to spur men on to distinguish themselves, has degenerated into a fierce competition for the highest profits,—a struggle in which each man's one object is to get to the front and thrust his neighbour aside, and none has time to think of such frivolities as grace and beauty.

In former ages the aim of men generally was to enjoy life when not oppressed by arbitrary tyranny. Evils there were,—some of them great evils,—but they were not evils which vitiated men's whole lives, which gave a sordid motive to their every act; they had leisure and energy to bestow on their work, and could indulge the desire to make it beautiful, which is natural to a free agent. Now, the struggle to live has been substituted for the enjoyment of life. That which should be only the means has become the end. In place of an inspiriting emulation, we have a fierce struggle for life and death.

If it be asked how can this be avoided, I should say by substituting order for the present anarchy in our industrial systems. Our mistake has been in supposing that the haphazard system which did fairly well in thinly-populated countries can possibly succeed in the dense crowds of to-day.

Let me give a rough-and-ready illustration. Suppose one of us asks half-a-dozen friends to dine and spend a sociable evening, no special organisation is needed to enable them to do so with comfort and pleasure. They can be hospitably entertained, and they will be able readily to find their own coats, umbrellas, and hats when they leave without any elaborate pre-arrangements to enable them to do so. But increase the numbers, and the case is altered at once. At a Royal Academy *soirée*, where there is an elaborate organisation, there is nevertheless some difficulty in obtaining re-

freshment, and in recovering one's out-door garments. Without organisation it would be impossible. There would be simply a free fight, and the battle would be to the strong.

Is not this what has happened in our wholly unorganised and reckless system of production and distribution?

When feudalism died out and men obtained the right to compete freely in the industrial market they believed that they possessed all that was necessary; that industry and ability would in the long run meet with its due reward, and that this principle would prove the surest incentive to the development of the best characters and the production of the best work.

With some very serious qualifications it did something like this for a time. Inequalities not arising from greater or less industry existed, but these were partly the remains of feudalism. Technically serfdom had been abolished, but wealth, rank, and privilege held its own, and though every poor man was legally free to compete with the rest, without education or means the right was a somewhat barren one.

Time gradually, however, developed unjust inequalities arising from the system itself of so-called free competition, at first gradually, but, since the great development of machine power, with frightful rapidity, with the result that we have now reached the maximum of injustice. I appeal again to Mill for an accurate description of the present distribution of the good things of the world:—

"The produce of labour is apportioned, as we now see it, almost in an inverse ratio to the labour,—the largest portions to those who have never worked at all, the next largest to those whose work is almost nominal, and so in a descending scale, the remuneration dwindling as the work grows harder and more disagreeable, until the most fatiguing and exhausting bodily labour cannot count with certainty on being able to earn even the necessaries of life."

Such a monstrous condition of things as this is manifestly intolerable to all humane and justice-loving persons, and it has long exercised the minds of thoughtful men, who not only deplore the cruel injustice of the system, but perceive that unless we can remedy it in time, it must lead to some appalling catastrophe. It is not, however, the question of justice and humanity that concerns us directly to-night, but the influence of this industrial anarchy upon art.

Well, what has been the effect of the free fight for existence on art? Why this, that people have enough to do to live, they have no time for anything else. They cannot stop to think of enjoyment of life. Their energies are exhausted in the struggle for food, clothing, and a roof over their heads. Having, some of them, got this, they then begin the struggle to have more than their neighbour; there is still no time to think of enjoying life, they have got to imitate the class above them. The labourer who is successful and gets a rise in life looks forward to the joy of wearing a shiny black chimney-pot hat. The tradesman on whom the delights of broadcloth and pot hats have begun to pall, struggles, and wears himself out in the hope of some day riding in his carriage, and so forth and so forth, through the whole degrading series. Snobbery being the guiding impulse, profit-making the efficient machine.

Sordid struggle for the necessaries of life at the bottom of the scale, far more sordid struggle to outdo one's neighbour at the upper end of the scale.

Where do Art and Beauty come in? Where is love of good work gone? There is no time for either. Will it pay? is the one question,—not "Do I love doing it?" Is it worth having when done? If I don't produce the largest number of articles in the shortest time, if I don't screw my workmen down to the lowest wages they will put up with, and make my customers pay the highest price I can get out of them, I shall fall behind in the life and death struggle for profit. Beauty! What have I to do with beauty? Will beauty pay? Fashion! That's the point! Everybody is wearing this. Everybody is asking for that. The other? Oh, I don't keep it,—I assure you, madam, it's quite gone out—no one asks for it—that is, no one of consequence.

Can anyone deny that this fairly describes the present state of respectable society? And I ask, can art live in such an atmosphere? In order to picture to ourselves more vividly the contrast between our present condition and that of earlier ages, imagine for a moment the effect if we were to take any of the pictures of Paul Veronese, a man who lived in a great business community, a mercantile state, and drew all his images from his daily experience,—take one of his works, such as "The Marriage at Cana," and put all the figures into modern respectable costume, and you will then realise the extent to which taste has been degraded, and our daily life made hideous by the intervening rapid development of the principle of competition for profit, and the growth of greed for money, to the increasing exclusion of all other interests.

Now, if it is proposed to reform these crying evils, to get rid of the iniquitous injustices of our system, and liberate art from the stifling, noxious atmosphere which is all but destroying her, one is generally met with the cynical objection that you must regenerate human nature before you can alter these things, the objection being accompanied with a sneering scepticism as to the improvability of our nature. I should like to ask these objectors how, on their theory of the unredeemable baseness of human nature, they explain the past? Whence comes all the beauty bequeathed to us by our ancestors which we treasure in our museums, if it is an ineradicable part of our nature to prefer vulgar display to true beauty, the heaping-up of profit to the doing of good work?

We have before us the past history of our race, we find in all parts of the world and in every period of its existence a prevailing love of beauty so strong that it has triumphed over the defects of our nature and the imperfect conditions of society. The sense of beauty varied much with place and time, but the love of it predominated everywhere. If ravages of war trampled upon it for a time, it sprang up again spontaneously with renewed vigour, with restored freedom and peace. We have scores of centuries teaching us one great lesson, that human nature loves beauty rather than ugliness as surely as it loves health rather than disease, joy rather than sorrow. Against this vast mass of evidence we have one century offering a partial exception to the otherwise universal rule, and yet there are people so blind to all the teaching of history, so oblivious of everything but their own limited experience, that they speak of beauty as if it were an acquired taste foreign to our nature, and that this nature must be wholly changed before we can attach any value to it. Is it not more rational to conclude that the spirit which prevailed for thousands of years is that which truly pertains to our real human nature, and that the partial exception exhibited by this century is a temporary aberration, a disease? I referred to periods when art had been for a time trampled under foot by the ravages of war. What else is it that now tramples art under foot but a great civil war, an internecine strife between neighbours forced upon us by a system so blundering, so inadequate, that the only wonder is that men have permitted it so long?

What we have to do is to change this rotten, oppressive system, to substitute order for anarchy, and then, when men are not exhausted by the mere struggle to live, they will have freedom for the expansion of their natural faculties.

How to get rid of this industrial chaos and to establish order in its place is the great problem which is engaging the earnest attention of many of our best thinkers, and which is rapidly becoming the most prominent subject of social interest. The evils have long been recognised, and crude reformers were ready in abundance to advocate the redistribution of property regardless of the consequence that if society were made equal by Act of Parliament to-morrow they would be unequal again by acts of industry or recklessness next week. A destructive principle has happily never won the approbation of the mass of the people. The confusion is bad enough already; we cannot better our condition by aiming at a confusion worse confounded. What we need is a righteously and wisely re-modelled industrial system, which shall ensure to all the fruits of their labour, and leave to each the opportunity to assert his own individuality, which shall make worthy distinction and the gratitude of one's fellows the incentive to good work instead of the debasing attraction of piling up more money and exhibiting a more vulgar display of brainless and graceless luxury than our neighbour.

As I am not here to address you on Political Economy, but on Modern Art, I will not enter upon an elaborate examination of any of the systems having the above aim, which are now before the world, I will only say so much as is necessary for the consideration of their bearing on Art. Some of you have probably read Mr. William Morris's "Signs of Change." Some years ago Mr. Morris's views on this subject appeared to me to lead to destruction with no principle of re-construction to follow. Such a course as this is, in my opinion, worse than no solution at all. A revolution of violence, without even a clear scheme of just industrial reform in view, could only end in the re-establishment of the old tyranny on a firmer basis. A red terror is usually succeeded by a white terror. I was very glad to note a totally different tone prevailing in this recent publication. It is largely constructive, and it deals chiefly with social reform in relation to industrial arts.

The admirable volume of "Fabian Essays" published in January, of which the entire first edition was sold out within a fortnight of its issue, is a collection of most thoughtful papers wholly constructive in their aim, and these also deal ably with questions of taste and art. But the most popular, and I may also say the most daring, attempt to solve the great problem is that contained in Mr. Edward Bellamy's "Looking Backward," a book which, I suppose, I may safely assume most of you have read. The main principles advocated in the book are not new, but they are exhibited and applied with extraordinary ability, and evince a most rare capacity for organisation.

It would take me too far from my main subject to touch, even lightly, on the objections urged by some to the scheme propounded in the book, but I am fortunately able to quote again from that sound authority Mill an emphatic opinion as to its practicability, as to the greater incentive to work it would provide, and its enormous superiority to our present system:—

"Whatever may be the merits or defects of these various schemes, they cannot be truly said to be impracticable .... The objection ordinarily made to a system of community of property and equal distribution of the produce, that each person would be incessantly occupied in evading his fair share of the work, points, undoubtedly, to a real difficulty. But those who urge this objection forget to how great an extent the same difficulty exists under the system on which nine-tenths of the business of society is now conducted .... A factory operative has less personal interest in his work than a member of a Communist Association, since he is not, like him, working for a partnership of which he is himself a member .... If Communistic labour might be less vigorous than that of a peasant proprietor or a workman labouring on his own account, it would probably be more energetic than that of a labourer for hire who has no personal interest in the matter at all .... If, therefore, the choice were to be made between Communism with all its chances, and the present state of society with all its sufferings and injustices; if the institution of private property necessarily carried with it as a consequence that the produce of labour should be apportioned as we now see it;* .... if this, or Communism, were the alternative, all the difficulties, great or small, of Communism would be but as dust in the balance."

I must ask you to accept this weighty opinion provisionally as sufficient proof that a system such as that sketched in "Looking Backward," where all contribute to the production and all receive their share in the distribution, is not a wild Utopian idea unworthy the notice of a serious political economist. If any of you have so regarded it, I will ask you to keep in mind that the greatest political economist says,—"Whatever be its merits or defects, it cannot be truly said to be impracticable," and that "all the difficulties, great or small, attending it would be but as dust in the balance" compared with the evils of our present system.

Having given you high authority in favour of the practicability of the scheme, I am also able to quote an authority that you will all respect as to its favourable influence on art. I have discussed the book much with Mr. G. F. Watts, who is not merely a profound believer in the wisdom and justice of the social and industrial system advocated in "Looking Backward," but in the immensely favourable influence it would exert on art.

On this point, and on the reasons for holding this view, I may say we are entirely at one. We believe that the love of beauty is inborn, and inseparable from our nature; that even under most unfavourable conditions it will assert itself, and that leisure and a wholesome life are all that are needed to give it free play.

To this most vital question let me invite your attention for a few minutes. What is Love of Beauty? What is its origin? Is it inseparable from our nature? Does an enquiry into this strong impulse, that even in this dark age still actuates so many, confirm the teaching of

* *Vide* quotation in first column.

history that it must predominate if not crushed by some grinding tyranny? I would say we are what we are by virtue of all the influences that have operated on us from the remote æons, when the primitive germs from which we are descended first possessed a sentient organic existence. We have, by an unerring and mighty process, been moulded into our present condition by the action of our environment. The harmony between ourselves and that environment is not arbitrarily determined, but inevitable. Between our consciousness and the minor so-called accidents of nature there may be occasional dissonance. Between our consciousness and the great enduring facts of nature, under whose influence we have come into existence, there must be consonance,—there must be harmony as between a child and the mother that gave it birth. That quick response of our sentient nature to the great mother Nature is Love of Beauty, and nothing can utterly destroy it, except transportation to another universe.

It has been universal, and is so still, where the foul monsters Profit and Snobbery have not established their corrupting rule.

Remove these. Let men work in comfort, and without sordid cares or corrupting motives, and they will naturally prefer to work well than ill. Add to this the powerful incentive of public esteem, and they will work with zest and vigour.

What people call a routine in Mr. Bellamy's system is a simple series of inducements, which, by ensuring that each worker gets the full credit of his work, gives him the most powerful incentive to distinguish himself, by the excellence of his work or by the improvements he can effect.

The routine proper is only applied where method, by avoiding the waste of time on worthless objects, gives us more time to devote to that which is worthy. The abolition of the consideration "will it pay?" so paralysing to Art, will enable men to do good work for the pleasure of doing it and for the credit and distinction they will worthily gain by it. The collapse of snobbery, or the abolition of class distinctions, of the temptation to display and what Mill calls "the silly desire for the appearance of a large expenditure," will set men free to surround themselves with that which gives them pleasure, instead of that which is expected of the class of society to which they would be thought to belong. It will revive the simplest and most wholesome motive in place of the most degrading, it will create a demand for that which is beautiful instead of that which is ostentatious and therefore vulgar.

Moreover, the growth of brotherhood will give a great impetus to public spirit, and, while we are adding to the charm and comfort of home life by substituting simplicity and beauty for the senseless gewgaws of an expensively-furnished modern drawing-room, we shall unite in the erection and adornment of noble public buildings which all can enjoy, and which, with universal education, all will enjoy. The spirit which produced the Parthenon and the middle-age cathedrals will reappear, and art will have a scope hitherto unknown.

These are the influences which such a system will exert on our daily life, but not less wholesome will be the influence of its training and its ethics. Every man and woman will begin life with a perfect education, and will be brought up to regard work as noble, and living idle on others' work as a degradation so shocking that, though it will be on record as having been permitted in the Dark Ages, it will be as unintelligible as the massacre of St. Bartholomew is to us. Every one will take their share in the three years' labour conscription, and will enter on adult life with a knowledge of what it means wholly inconceivable to us, so that consumption of luxuries without any regard to the cost of their production must disappear.

One of Mr. Bellamy's best passages is that which treats of the disappearance of the word menial from the social vocabulary, and the enunciation of the pure rule of life that it is base to ask a service of any one which we would not willingly render to them; baser still to treat them with contempt because they render such a service; while the asking it with intention of not rendering it is like borrowing money with the intention of not repaying.

I have feebly indicated the benefits which would be conferred on art by the substitution of a just system of production and distribution for the vicious one which now stifles it, but I hope I have said enough to show that the subject is one worthy of our careful study. I would go further and say that the view is one the promotion of which is worthy of our most earnest efforts if we would see art recover from the paralysis which now afflicts it.

We all deplore the inferiority of the art, especially the technical art of the day, but, as a rule, in our efforts to improve it we deal with symptoms rather than causes. It is as if we found a man earnestly poring over a book in a room where hardly any light entered, and he mourned the darkness, declaring that the sun had not shone for years, and that he was weary with straining his eyes in his efforts to learn, and we said, "You are wrong; the sun is shining brilliantly outside; but look at your window,—it is crusted with the grime of years, through which no ray can penetrate. Clean this, and your task will be easy!" So we are groping for sound principles of art and pondering how to restore our technical arts, and do not see that the windows of our mind are crusted over with the darkness of low aims, selfish desires, with all the suffocating influences of profit-mongering, greed, ostentation, and snobbery. Let us up and clean our windows and let the light in, and we shall see to do good work.

[We will give some notes of the discussion in our next.]

ENGINEERING AND BUILDING EXHIBITION AT THE AGRICULTURAL HALL.

What is grandiloquently described as an "International Exhibition of Machinery, Manufactures, Appliances, and Inventions incidental to Engineers, Electricians, Builders, and Ironmongers," was opened in the Agricultural Hall, Islington, on Monday. We say was "opened" on Monday, but that is hardly correct. The hall was opened to visitors, but barely half of the exhibitors had thought it worth while to have their stands ready; and even on Wednesday afternoon there were several stands incomplete. Its scope, as will be seen from the above description of it given by its promoters, is wide enough, but the exhibition is not a very extensive one, and the building trades are very meagrely represented. The exhibition hardly covers two-thirds of the ground area of the hall, and it only serves to strengthen the opinion which we have before expressed, that these small exhibitions, recurring at frequent intervals, are almost "played out." Where the "international" element comes in it is at first difficult to see from a glance at the catalogue, for all the exhibitors are English or Welsh firms. On closer inspection, however, one sees that some of the things exhibited are of foreign origin, and shown by English agents of the manufacturers.

As we have said, the building trades are very meagrely represented, but there are some exhibits of interest to which we may briefly direct the attention of visitors.

In the arcade leading to the Hall from the Islington-green entrance, Messrs. Chambers, Monnery, & Co. have a very good display of stoves, grates, and ranges. Specially worthy of attention at this stand is Rogers's patent range, which is devised on scientific principles. All the air needed to support combustion is warmed on its passage to the fire, which is, of course, closed in. This arrangement is conducive to both economy of fuel and cleanliness, and as no fender is required, the cook is able to get closer to her work.

Messrs. J. H. Heathman & Co., Stand No. 2 in the Hall, have a useful display of fire-extinguishing apparatus, telescopic ladders, &c. At Stand 5 Messrs. F. Edwards & Co. show the "Teale" grates and a kitchener. Some "gas-cookers," as they are somewhat curiously termed, are shown at this stand. They are made by Messrs. Galli & Co., of Leeds. Messrs. O. Berend & Co., at Stand 8, have a showy display of electroliers, gaseliers, &c.; next comes the Bristol Wagon Co., with a collection of useful carts and wagons suitable for builders, contractors, and others. Mr. F. W. Way, at Stand 16, exhibits what looks like a very good chimney-pot, calculated to prevent down-draught, and capable of being swept right through.

Mr. Robert Adams, of Newington-causeway, exhibits at Stand 18 his patent spring and pneumatic hinges in different forms to meet varying requirements. They are all admirable of their kind, and the same may be said of his reversible sash-windows. Mr. Adams also exhibits a very good water-bar for French casements. At Stand 25, Turpin's Parquet Floor Company have a very good show of parquet and mosaic floorings. Their inch-thick antiseptic beech-block floor is worth seeing. Messrs. Clemens, Abeil, & Co., Stand 32, exhibit a street-sweeping machine and a water-van, both of good type.

At Stand 24 Mr. Dan Rylands has a very interesting exhibit in the shape of glass-lined iron piping, specially adapted for water service-pipes, chemical factories, and for channels for electric-lighting wires. This exhibit should be looked at by visitors. These pipes are stated to cost twenty per cent. less than lead pipes. At Stand 28 Messrs. R. Anderson & Co. exhibit lightning-conductors, wire-rope, &c. The New Wire Wove Roofing Co. (Stand 52) have a light erection showing the capabilities of their roofing materials known as "Carboline" and "Duroleine;" the first-named is opaque, and the second transparent. They are both very light, and well-adapted for use in portable buildings and temporary structures.

Messrs. Shand, Mason, & Co. (Stand 53) have a very good display of fire-extinguishing apparatus. Well worth notice is a new hose-holder, which is in the form of a hollow bracket pivoted so as to turn in any direction. In this hollow bracket there is space for a 50 ft. length of hose to be lightly folded up, not *rolled*. One end of this length of hose is attached to the hydrant or rising main, and the other end is of course fitted with a nozzle. On an alarm of fire being raised, the bracket containing the hose can be swung round to any desired angle, and on anyone catching hold of the nozzle and running away with it, the length of hose is at once extended and the water turned on, thus saving the time which is often lost in uncoiling a length of hose. In the yard, at the side of the Barford-street entrance of the Hall, Messrs. Shand & Mason give demonstrations twice a day of the efficiency of their automatic sprinklers for fire extinction. Messrs. F. Jones & Co. (Stand 60) show the various applications to building purposes of that very useful and curious fireproof material known as "silicate cotton," or "slag wool." Next door, at Stand 61, Messrs. R. W. Hitchins & Co., show their specialities in fireproof and sound-proof plastering, including their "combination slabs." At Stand 70, Messrs. Ashworth & Kneen exhibit the "Toboggan" (or sliding) springless locks and latches, which merit the notices of visitors.

In the centre of the hall the proprietors of Aspinall's enamel have a gaily-coloured stand, showing the numerous applications, to all kinds of materials, of their useful preparation. Some of the exhibitors of mantel-pieces and over-mantels, in wood and cast-iron, have decorated their exhibits with this enamel.

Messrs. Johnson, Clapham, & Morris (Stand 74) show very well the many capabilities of their patent fireproof wire-lathing for ceilings, partitions, &c. They have also a good display of wire-work generally, including wire-rope lightning conductors. Messrs. Yates, Heywood, & Co. (Stand 82) have a large show of stoves and ranges, together with wood and cast-iron mantels and overmantels. There are two or three other exhibitors of this class of goods, but there is an absence of bricks, tiles, stone, and other essential elements of an exhibition which is avowedly, in part, at least, devoted to the building trades.

At Stand 101 Mr. Henry Bassant makes an excellent display of well-executed parquetry work for floors, walls, or ceilings. There are numerous types of gas-engines exhibited, but one of the quietest in working is that shown by Fawcett, Preston, & Co., at Stand 112. Messrs. G. B. Kent & Sons (Stand 125) show a case of brushes. Messrs. Messer & Thorpe (Stand 140) exhibit what they call "the patent bucket fire extinguisher," which consists of a tank or cistern in the shape of a pedestal or cabinet containing a number of buckets always fully charged with water. Messrs. E. H. Bayley & Co. (Stand 145) show a very good and easily-worked tip-van suitable for slopping or contractors' purposes. At Stand 147 the Patent Wood Decorating Co. exhibit a collection of Mitchell's patent ladders and steps for a variety of purposes. They are very ingenious and strong, and are well worth the attention of visitors. The Company also show their process of decorating wood, which consists merely of a thin veneer. It is shown applied to coffins, and we were informed that a common deal coffin, veneered to look like a coffin of some costlier wood, can be sold for 25s., whereas a

coffin of the real wood imitated would cost 5*l.* or 6*l.* at least. Here is another chance for the gratification of that false ostentation which Mr. Henry Holiday condemned in his paper read before the Architectural Association the other evening, even if it does not lead to fraud by unscrupulous undertakers.

Messrs. Crossley Bros. (Stand 152) exhibit a 14-horse power horizontal "Otto" gas engine, working one of Laing, Wharton, & Downs's dynamos, supplying a number of arc-lights for illuminating their stand. Messrs. E. Jacobs & Co. (Stand 163) exhibit wood-working machinery and fans in motion. The Blackman Air Propeller Ventilating Co. (Stand 173) also exhibit fans in motion. Mr. E. S. Hindley (Stand 174) shows steam-engines and saw-benches. Messrs. Lewis & Lewis, at Stand 176, have some woodworking machinery, worked by a portable steam engine and portable shafting; and Mr. H. Heim (Stand 177) shows his specialties in stoves.

We have thus enumerated some of the exhibits which are of most interest to our readers. The exhibition will remain open until the evening of Saturday, the 29th inst. We trust that before then visitors will have the advantage of a revised catalogue. The one issued on the opening day was very incomplete, and full of mistakes.

ARCHITECTURAL SOCIETIES.

The Architectural Association.—The usual fortnightly meeting of this Association was held on Friday, the 14th inst., at 9, Conduit-street, Mr. Leonard Stokes, the President, in the chair. The minutes having been read and confirmed, the following gentlemen were duly elected:—Messrs. L. C. T. Moore, E. O. Cummins, W. H. Brown, J. J. Wilson, W. A. Sugden, E. Borissow, and H. M. Brown. Mr. F. R. Farrow (Senior Hon. Sec.) announced that he had been asked to recommend to their notice an appeal for funds for the restoration of the tower of Frampton parish church, of which Mr. C. Hodgson Fowler, of Durham, was the restoring architect. Mr. E. S. Gale (Hon. Sec.) called attention to the visit on this Saturday, the 22nd inst., to the new Central Offices for the Metropolitan Police on the Victoria Embankment. The architect of the buildings, Mr. Norman Shaw, R.A., will meet the party. Mr. H. Holiday then read a paper on "Modernism in Art," which we print in another part of this week's *Builder*.

Leeds Architectural Society.—At a meeting of the Leeds and Yorkshire Architectural Society, held on Monday evening in the Law Institute, Albion-place, Leeds, a lecture on "Henry Aldrich, his Work and Writings," was delivered by Mr. Paul Waterhouse, of London. The chair was occupied by Mr. Henry Perkin, President of the Society, and there was a good attendance. Mr. Waterhouse, in the course of his lecture, pointed out how many of the greatest names in the history of architecture, especially since 1400, were those of men who had studied, and even mastered, more than one branch of apparently alien sciences before turning to architecture,—men who, having been educated to some other profession, had been led either by inclination or opportunity to the study and practice of architecture, and turning to it had found their faculties rather prepared than hindered by even half a lifetime spent in what nowadays would be classed as irrelevant studies. As examples he cited Alberti in Italy, Perrault in France, and in England Sir Christopher Wren. The Italian, besides many other occupations, was a lawyer; the Frenchman had practised as a physician; and our fellow-countryman had arrived at so great a distinction in the scientific world before he gave attention to the art of building that he did not seriously become an architect until he was a Fellow of the Royal Society and a professor of astronomy. In the same way Henry Aldrich, Dean of Christ Church, claimed attention as one who brought into his architectural studies a mind practised in many and different branches of art and science. The four designs attributed to Aldrich, who was born at Westminster in 1647, were,—the Chapel of Trinity College, the Peckwater Quadrangle of Christ Church, the garden front of Corpus Christi College, and All Saints' Church. The features of these buildings were minutely described by the lecturer. On the motion of Principal Bodington, seconded by Mr. W. H. Thorp, and supported by Mr. G. B. Bulmer, a vote of thanks was accorded to Mr. Paul Waterhouse for his interesting paper.

Manchester Architectural Association.—At the ordinary meeting of this Association, held at the Diocesan Buildings on Tuesday, Mr. T. Chadwick in the chair, the following gentlemen were elected as officers for the next session:—President, T. Chadwick, A.R.I.B.A.; Vice-Presidents, E. Hewitt, A.R.I.B.A., and J. D. Mould, A.R.I.B.A.; Treasurer, A. H. Davies Colley, A.R.I.B.A.; Librarian, J. S. Hodgson; Registrar, J. H. Woodhouse; Secretary, J. D. Mould, A.R.I.B.A.; Committee—P. E. Barker, A.R.I.B.A.; P. Hesketh, A.R.I.B.A.; E. P. Hinde, A.R.I.B.A.; J. Horsfall, F. W. Mee, W. E. Potts, A.R.I.B.A.; F. B. Smith, E. H. Stelfox, A.R.I.B.A.; and G. H. Willoughby. Mr. W. E. Potts read a paper entitled "Creeds in Architecture." He contended that architects voluntarily fettered themselves, and limited the possibilities of their achievements, by subscribing to certain traditions which, in course of time, crystallised into creeds, such as the belief in the cruciform plan in churches, which in many cases was now unsuitable to the present form of worship. The paper pleaded for wider sympathies, a cultivation of an open-minded ability to discover merit wherever it might exist, and a struggle against prejudices. Messrs. Mee, Colley, Ross, and Hodgson took part in the discussion which followed.

SANITARY INSTITUTE EXAMINATIONS.

SIR,—On April 17 and 18 next the Sanitary Institute Council will hold an examination to grant certificates of competency in sanitary knowledge to would-be sanitary inspectors. The time at which the examination is to take place will be between the hours of eleven and two o'clock on each day. Surely the Board of Examiners could make the time to fit in better with the arrangements of the candidates than this. The men who will offer themselves for examination are for the most part mechanics, or others whose time is not at their own disposal, and have only Saturday afternoons and evenings at their disposal, and to be absent for the most important part of two days, or one might say the whole of two days, would be at the risk of losing their present situations.

The lectures at the Institute are held in the evening, to enable the greatest number to attend; the same rule should apply to the examination. I trust that the Council will see its way to make this alteration in the forthcoming examination in April next, and thus keep in touch with the Science and Art (South Kensington), the Birkbeck, Polytechnic, and kindred institutions, which hold their examinations on Saturday afternoons after two o'clock.

March 13, 1890. SANITATION.

PLATINISED PLATE GLASS.

SIR,—Will any correspondent of the *Builder* kindly inform me of the name and address of any firm where I can obtain a quantity of "Platinised Plate Glass" for builder's work?

Kinsale. A. PERRY, Builder, &c.

PREPARATION OF MOULDINGS.

SIR,—We have an inquiry from abroad for an attachment to a moulding-machine for laying on the white preparation on mouldings, preparatory to gilding or painting.

We shall be much obliged for any information that any of your readers can favour us with as to the most approved method of putting on the preparation referred to, and as to whether it has ever been done in a moulding machine?

MANCHESTER ENGINEERING CO., LD.

Stalybridge, Manchester.

Patten-makers' Company.—A court dinner of the Worshipful Company of Patten-makers was held last week at the Cannon-street Hotel, by invitation of the Master, Mr. H. H. Bartlett, head of the firm of Messrs. Perry & Co., contractors, Bow. Among the guests present were Mr. Barrow Emanuel, M.A., Past Master, Major Clifford Probyn, L.C.C., Mr. Arthur J. Baker, and Mr. H. Lovegrove, members of the Company; also Sir P. Magnus, Mr. A. M. Peebles (City Architect), Mr. W. E. Stoner, Mr. Augustus Manning, Mr. T. E. Franklin, Mr. R. L. Curtis, Mr. H. A. Hunt, Mr. C. J. Shoppee, Lt.-Col. B. Fletcher, Mr. Chas. Barry, F.S.A., Capt. J. A. Thornhill, and others connected with building matters.

Munich.—According to the *Deutsche Baugewerks-Blatt*, the proposed building for the New Law Courts is to be erected on the site of the old cadet school. The rough estimate to the design of Professor Thiersch shows a cost of some 5,000,000 marks, or nearly 250,000*l.*

The Student's Column.

ELECTRICITY, MAGNETISM, AND ELECTRICITY SUPPLY.—XII.

DYNAMO-ELECTRIC MACHINES—(*Continued*). DRUM ARMATURE.

THE electro-motive force only, set up in the skeleton dynamo discussed in the last article, was considered, and no device for connecting the moving conductor with a circuit, so as to produce a current available for external use, was shown. In fig. 29 the ends of the rectangular conductor are connected to the two halves of a split tube, properly insulated from each other, and against these press fixed contact-springs or "brushes." By

FIG. 29.

these means a current, always flowing in one direction, though intermittent, can be collected from the apparatus previously shown in fig. 28. Such an arrangement is called a commutator. If, instead of the pieces P and Q, continuous rings or "collectors" are used, so that a brush is always in connection with the same end of A B C D, the current in the external circuit will be alternating as well as intermittent. We shall in future call A B C D a coil, which may contain many turns, though for simplicity, only one complete turn is shown, and a number of such coils wound radially on to a cylinder or drum form the "armature" of a large class of direct-current dynamo-machines. Armatures built up in this way are called "drum armatures," a type of armature now adopted in, perhaps, the greater number of direct-current machines made, the commutator being constructed, not of a tube split into two parts, as in fig. 29, but of a tube split into as many segments as there are coils on the drum.

The way in which the E.M.F. is set up and varies in each bobbin is more easily traced in this than in any other type of machine; but the connexions between the ends of the coils and the different segments of the commutator look complicated, and should be carefully traced. There are many different methods of making the connexions, though, as the general principles underlying all of them are the same, not more than one will be given.

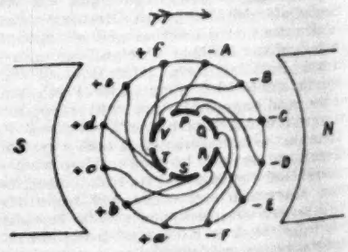

FIG 30

Fig. 30 represents an end view of a drum armature with six coils. On comparing fig. 30 with fig. 26 or 27, it will be seen that the E.M.F. set up within each coil is from big letter to little letter, and the current, if allowed to flow, will be from little letter to big letter across the external connexions. The connexions of the ends of the coils with one another are made through the segments of the commutator, and it will be seen that P is joined to two − ends, while S is joined to two + ends, but that all the rest of the segments connect a − and + end together. On tracing the connexions through the armature, it will be found that two equal electro-motive forces, each produced by three coils, are developed in the two paths from segment P to segment S. The paths through coils and segments are shown diagrammatically in fig. 31, which should be used in conjunction with fig. 30.

What is happening, then, is this,—the three

coils *Aa*, *Cc*, *Ee*, are placed in series, and this series of three is put abreast with the other series of three, viz., *Ff*, *Dd*, *Bb*. From either figure it is evident that P and S are the segments which are at lowest and highest potential respectively, and on these press the brushes, omitted in the drawing, so as not to confuse the other connexions. It must not be supposed that a machine of this kind would have but six coils; forty, or even sixty, according to the size of the machine, would be nearer the true number, but the connexions for so many segments could not be shown in a small figure, and six are sufficient for the present purpose.

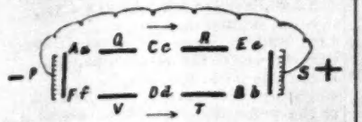

FIG. 31.

We have now to consider how the direction of the current in each coil changes as the segments of the commutator slide beneath the brushes.

We have already stated that we do not propose, in these articles, to describe the mechanical details of any particular machines, but what we shall endeavour to do is to assist a student in understanding the general action of any machine with the construction of which he may be familiar.

To a beginner, the connexions in the armature of any direct-current machine seem complicated, and, even when they have been traced, the precise way in which collection and commutation of the current take place may not be clear; we therefore suggest that any student who feels a difficulty on this score should make, in each case, a diagram on card, similar to that shown in fig. 32.

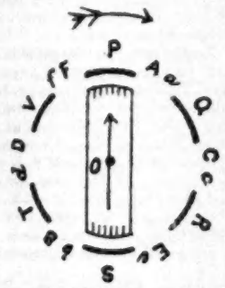

FIG. 32.

Draw the segments of the commutator on a circular piece of card, with sufficient space between them to write down the letters denoting the ends of the bobbins to which they are connected. Next cut out a piece of card O, to represent the brushes and the external circuit, and, with an ordinary pin as axis, fasten it to the centre of the diagram of the commutator and coils. The breadth of the brushes must be sufficient to just bridge across the space between the commutator segments, otherwise when a brush quitted a segment the circuit would be broken. If the commutator be now revolved in the direction of the feathered arrow, and the brush-piece held vertical, the current is represented as flowing in the external circuit from brush to brush in the direction shown by the arrow on O. When the brushes connect V and P together, and R and S, the coils *f* F and *E e* are short-circuited through them; in a properly-arranged machine this takes place when the short-circuited coils are not cutting lines of force, or at all events so few, that they are not contributing E.M.F. sufficient to drive the current through themselves, and it is therefore of advantage to have their then useless resistance cut out of the circuit. The moment the short-circuited coils are brought into action again by the brushes having finally quitted P and S, current flows in them, but in the reverse direction.

The coils of an armature, instead of being permanently connected together, as in fig. 30, are sometimes connected to separate segments of a commutator, which lie side by side, and temporary connexion is made by the brush as it slides over the two pieces. Such an arrangement is called an "open-coil armature." In using the diagram (fig. 32) for an armature of this description, the parallel sets of segments must be represented by two circles instead of one, or they may be drawn on a paper cylinder, and the brush piece made to touch it on the outside.

Books.

Murray's Handbook for England and Wales. Alphabetically arranged for the use of travellers. John Murray. 1890.

THE exploration of England by means of driving tours, or in humbler fashion by cyclists, is an interesting feature of modern life. Out-of-the-way-places, unvisited since mail-coaches and post-chaises passed away, are now made special objects of search, and the result is that the "Beauties of England and Wales" are obtaining a wider appreciation, and the tourists' wants have been duly recognised by Mr. Murray. Of course, it is impossible in a single volume of less than 500 pages to give detailed descriptions of every town and village in the kingdom. There are handbooks issued by the same publisher which deal more fully with the subject, and number in all some twenty volumes—a costly and rather cumbrous collection. These local books are excellent for residents and visitors who want to see everything, but as each of them necessarily treats of a limited district, their employment is similarly limited. You may have the handbook for Surrey with you, but so soon as you cross the borders of Sussex it becomes useless. To mark, therefore, the requirements of a locomotive age this compendious volume has been issued, and merits warm commendation. The plan adopted is to describe, in alphabetical order, the principal towns and places of interest in England and Wales, to indicate the excursions that may thence be taken, and to give cross-references in those cases where a spot, unimportant in size, has claims to separate mention. We have not read every page of the book, but have examined its contents with sufficient care to be able to say that the information given is trustworthy, and, in most cases, adequate. Little errors in such a work are unavoidable. Change of ownership, in these days, occurs so frequently as to make it almost impossible for an editor to be quite up to date, though this plea, perhaps, scarcely covers the retention of Lord Redesdale's name (p. 281), for that peer was too prominent a figure to have passed unnoticed away. We are a little disappointed with the rather casual indications of the "art treasures" which form the objects of chief interest in most country seats. Thus, under Longford Castle, bare mention is made of "Claude," and no hint is given that the gallery there contains two of the finest examples of that painter to be found in all England. We notice the statement that "the restoration of Ely Cathedral was set on foot by the late Dean Peacock," and that Sir G. G. Scott was the architect. Some portion of the work surely was executed under the supervision of George Basevi, whose name might have been mentioned in connexion with it, just as that of Cottingham should have been given as the part-restorer of Hereford Cathedral, while that of Mr. H. H. Gibbs should not have been omitted in any account of what has been done at St. Albans Abbey. These are trifles which simply show that the book is not perfect (a good index would be an improvement); but they are not the fault-findings of a captious critic, indifferent to the real excellence which distinguishes this useful volume.

Practical Iron Founding. By the Author of "Pattern Making," &c. London: Whittaker & Co.

THIS is a clearly-written and, as it claims to be, a thoroughly practical and sound little book; but yet it is difficult to see the field of usefulness it will occupy. The author announces that "it is written both for the student and for the practical man." There is, however, little, if anything, which those who have been through a good foundry are not likely to know, the greater part of the book being occupied by ordinary every-day practice. On the other hand, "the student,"—the innocent cause of so much book compiling,—is not likely to learn the practice of iron founding from book instruction. We suppose, however, such works as these fulfil some useful purpose, or they would not be produced in such numbers.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

5,846, Gas-brackets, Gaseliers, &c. J. Watkinson and T. Dodd.

According to this invention, two telescopic tubes are used, but one tube has a swelling which is packed so as to press or bear against the surface of the other tube, making a tight joint, and yet, at the same time, allowing the tubes to slide telescopically one within the other. Near the extremity of the inner tube is screwed a collar, the outer diameter of which is rather less than the inside diameter of the joint packing. This collar does not prevent free telescopic motion, but it effectually prevents the two tubes from being accidentally separated. Any number of glands or packing may be used, and gas stems or brackets applicable for attachment to walls or other supports may be similarly treated.

18,487, Brickwork. G. M. Fisk (U.S.A.).

The improvement which is the subject of this invention consists in the promiscuous use of various sizes and proportions of rectangular bricks in such a manner as to produce the effect of broken or irregular ashlars in brick work. The bricks used are of different sizes, but are all rectangular; the faces are either smooth or rough, but the manner of laying the bricks gives a better appearance to the front of a building.

18493, Bricks. G. M. Fisk (U.S.A.).

This is another specification by the same patentee, and relates to bricks for building purposes, and consists in producing a brick the face of which, while being perfectly finished and possessing the "skin" formed by pressure in moulding, has the general appearance of "split," "tooled," or similarly rough-faced stone. The rough face is produced by a suitable die used in the process of manufacture.

87, Screwdrivers. D. R. Hart (U.S.A.).

The object of this invention is to provide a screw-driver adapted to enter and fit very closely the slots of screw-heads, with a point so formed that its tendency to slip sideways during the insertion of a screw is effectually prevented, and having the two side extremities of its point strengthened so that danger of fracture is avoided; the driver has a sunk portion at its point adapted in thickness to enter and fit the slots of screw-heads. The rear of this sunk portion has concave shoulders to fit the form of round-headed screws.

257, Saw Swages. L. P. Halladay (U.S.A.).

A complicated machine for swaging saws by striking the toothed edge with suitable dies, movable by foot or hand-power, is described in this specification.

NEW APPLICATIONS FOR PATENTS.

March 3.—3,325, W. Summerson, Chimney Top. —3,336, T. Bibby, Saws. —3,340, S. Sutcliffe, Hinges.—3,343, T. Fletcher and others, Brick and Pottery Kilns.—3,345, E. Ives and G. Barker, Appliances for lifting, lowering, launching, and ending Bridges, Viaducts, &c.—3,346, F. Barnett, Construction of Low-level Composite Bridges over rivers.—3,678, R. Garside, Sash-fasteners.

March 4.—3,418, J. Dean, Water-closets.—3,431, J. Naylor and H. Williams, Moulding and Pressing semi-dry Bricks.—3,462, Baron Von Solemacher, Bricks, Tiles, &c.

March 5.—3,489, J. Thomas and T. Staff, Raising or Lowering Window-sashes. —3,513, A. Clark, Locking Fanlight-fastener and opener.—3,533, W. Bassingham, jun., Ventilators.

March 6.—3,592, C. Darrah, Water-waste Preventing Cisterns for W.C.'s.—3,598, C. Mills, Construction of Walls, &c.

March 7.—3,657, R. Morris, Door Checks.—3,671, B. Mills, Hinges and Door Checks.

March 8.—3,722, W. Wittooff, Flushing for Water-closets.

PROVISIONAL SPECIFICATIONS ACCEPTED.

509, W. Reynor, Testing and Flushing House Drains, &c.—579, W. Reynor, Cementing and Testing House Drains, &c., without taking up Floors, &c.—1,382, R. Sparke, T-squares, &c.—1,474, J. Griffiths and Others, Fittings for Gates and heavy Doors.—1,687, J. Nagel, Door Locks.—1,776, C. Phillips, Metal Dowels.—1,900, J. & A. Drexler, Roof Covering.—1,923, G. Dimmer, Chimney Cowls.—1,984, C. Fifield, Silicious Paving and Building Stone.—2,032, R. Carson, Adjusting and Holding Window-sashes, &c., in any Vertical Position.—2,223 and 2,224, J. Rendle, Glass Roofing.—2,394, B. Field and F. Andrew, Door Knobs, &c.—2,397, W. Blackband and H. Lunn, Securing Door-knobs to Spindles.—2,473, J. Bennison, Chimneys or Flues of Open or other Fireplaces.—2,509, J. Gutman, Stocks for Boring Bits. —2,536, C. Thomerson, Sheet Metal Roofing. —2,560, R. & F. Ambrose, Window Sashes and Frames, &c.—2,570, J. Walford, Door Wedge, &c. —2,695, H. Haddan, Ventilating and Cooling Cellars, &c.—2,787, E. Seddon, Sand-papering Wood.—2,895, W. Joy, Manufacture of Cement.—2,912, H. Badams, Gas Brackets and Chandeliers.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

7,650, H. Whitehouse and J. Clifford, Spring for Swing Doors.—20,914, A. Capperstuck and A. Meyer, Fireproof Ceilings and Walls.—20,976, H. Johns, Roofing Sheets of Fabric.—1,525, J. Button and Others, Ovens for Burning Bricks, &c.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 6.—By J. J. WHEELER (at Chelsea).

Chelsea—1 to 14, Little College-st., u.t. 18½ yrs., g.r. £70, r. £315. 18s. £800
159 and 161, King's-rd., u.t. 12 yrs., g.r. £3, r. £92 p.a. 520
20, Pond-ter., u.t. 11 yrs., g.r. £25 170

MARCH 10.—By T. WOODS.

Anerley—"The Rising Sun" public-house, f., and house adjoining, u.t. 60 yrs., g.r. £4 2,210

By FLEURET & SONS.

Hackney—31, Valentine-rd., u.t. 55 yrs., g.r. £5. 5s. 280
216, Well-st., and 42, Poole-rd., u.t. 55 yrs., g.r. £19. 5s., r. £128 1,300
Peckham—179, Peckham-pk.-rd., u.t. 49 yrs., g.r. £5. 2s. 6d, r. £25] 235
Stoke Newington—41, Harcombe-rd., u.t. 73 yrs., g.r. £5, r. £26 230
Wood Green—10, Cherson-ter., u.t. 90 yrs., g.r. £6 r. £27 210

MARCH 11.—By BOYTON & PEGRAM.

Pimlico—8 and 9, Ranelagh-rd., u.t. 34 yrs., g.r. £14, r. £80 560
Chelsea—117, Cheyne-walk, f. beerhouse, r. £100 p.a. 1,935

By DEBENHAM, TEWSON, & CO.

Kentish Town—Lg r. of £24, u.t. 58 yrs., g.r. 10s. 455
Shepherd's Bush—55, Wood-lane, u.t. 84 yrs., g.r. £3. 10s., r. £45 460

By DRIVER & PERFECT.

Holloway—11, Bedford-ter., u.t. 75 yrs., g.r. £ .. 130
Old-st.—37 and 38, Baltic-st., f., r. £72. 10s. p.a. .. 820
265 and 267, Old-st., f., r. £75 p.a. 1,010

By WALKER & RUNTZ.

West Ham—F.g.r. of £80, reversion in 58 yrs. 1,935
F.g.r. of £41. 10s., reversion in 30 yrs. 1,045
St. George's-in-East—L.g.r. of £50, u.t. 7 yrs., g.r. £10 p.a. 175
Whitechapel—L.g.r. of £80, u.t. 11 yrs., g.r. £10 400
Mile End-rd.—L.g.r. of £48, u.t. 19 yrs., g.r. £13 350
Commercial-rd. E.—L.g.r. of £84. 10s., u.t. 7 yrs., g.r. £13 325
Whitechapel—L.g.r. of £26. 6s., u.t. 17 yrs., g.r. £13s. 13s. 225
Kensington—L.g.r. of £40, u.t. £40, u.t. 14 yrs., g.r. £5. 10s. 225
Brixton—L.g.r. of £15, u.t. 5 yrs. 40

MARCH 12.—By G. E. CLARKE.

Walthamstow, Prospect-hill — The Residence "Melrose," r. £43 p.a. 560

By M. LIELL.

Bow-rd.—No. 212, c. 725
South Bromley—108 and 110, Teviot-st., u.t. 75 yrs., g.r. £8. 10s., r. £65 455
112, Teviot-st., u.t. 75 yrs., g.r. £4. 5s., r. £32. 10s. 255
Mile-end—2 and 3, St. Helen's-ter., u.t. 57 yrs., g.r. £14, r. £98 1,240
6, St. Helen's-ter., u.t. 57 yrs., g.r. £6, r. £32 .. 400

By D. YOUNG.

South Lambeth—29, Priory-rd., u.t. 90 yrs., g.r. £8 850

MARCH 13.—By PRICKETT & VENABLES.

Finchley, Church-end—The Residence called "Morpeth," u.t. 94 yrs., g.r. £7 910
Kentish Town—148, Carlton-rd., u.t. 70 yrs., g.r. £6, r. £34 265
Notting Hill—123 and 125, Elgin-crescent, u.t. 49 yrs., g.r. £17, r. £98 605

By FAREBROTHER, ELLIS, & CO.

Wandsworth-rd., &c.—F.g.r. of £333. 14s. 2d., with reversions from 53 to 58 yrs. 9,195

By C. C. & T. MOORE.

Ratcliff—103, 105, and 107, Brook-st., c. 770
Shadwell—3 and 4, Albert-st., u.t. 72 yrs., g.r. £12 525
Hoxton—69, Shaftesbury-st., u.t. 11 yrs., g.r. £4, r. £31 100

By NEWBON & HARDING.

Barnsbury—51, Wynford-rd., u.t. 55 yrs. g.r. £5, r. £40 325
Hoxton—110, New North-rd., u.t. 13 yrs., g.r. £6 200
Islington—42, Queensbury-st., u.t. 21 yrs., g.r. £4, r. £32. 200
Barnsbury—62, Offord-rd., u.t. 50 yrs., g.r. £7, r. £44 505
Islington—30, Arlington-sq., u.t. 37 yrs. g.r. £5. 5s., r. £44 425
90, Oakley-road, u.t. 50 yrs., g.r. £5. 10s., r. £48 450
Kingsland—101, Downham-rd., u.t. 29 yrs., g.r. £5. 5s., r. £38 250

By E. STIMSON.

Bermondsey—186, 188, and 190, Fort-rd., u.t. 47 yrs., g.r. £15 850
6 to 9, Woodland-pl., u.t. 38 yrs., g.r. £12 360
Putney—78, Disraeli-rd., f. 345
Norwood—42 and 44, Lancaster-rd., u.t. 88 yrs., g.r. £22 660
Brixton—5 to 11 (odd), Brailsford-rd., u.t. 84 yrs., g.r. £26. 555
Bow—62, Mayfield-rd., 80 g.r., r. £60 p.a. 580
Poplar—L.g.r. of £30, u.t. 11 yrs. 75
Borough—76 and 78, Red Cross-st., u.t. 54 yrs., g.r. £32 80

MARCH 14.—By G. PEARCE & SONS.

Dalston — 71 to 87 (odd), Holly-st., u.t. 27 yrs., g.r. £16 ..... £1,530
Hoxton — 12, Curzon-st., u.t. 41 yrs., g.r. £2. 17s. 6d., r. £39 p.a. 260
Hackney—95 and 97, Bentham-rd., u.t. 58 yrs., g.r. £9, r. £70. 14s. 460

By G. STOCKINGS.

Highgate—5, York-pl., f., r. £100 800
High-st.—A plot of f. land 260
98 North-rd., f. 550
Two plots of f. land 120
Tottenham—F.g.r. of £22. 2s. 6d., with reversion in 28 yrs. 780
Maidenhead—F.g.r. of £7, reversion omitted 160
Rotherhithe—602, Lower Queen-st., f. 210

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

MEETINGS.

SATURDAY, MARCH 22.

Architectural Association.—Visit to the new Central Offices for the Metropolitan Police on the Victoria Embankment, Mr. R. Norman Shaw, R.A., architect. 3 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Electricity and Magnetism." VI. 3 p.m.

MONDAY, MARCH 24.

Surveyors' Institution.—Adjourned discussion on Mr. T. W. Wheeler's paper on "Betterments." 8 p.m.

Society of Arts (Cantor Lectures).—Professor A. H. Church, M.A., F.R.S., on "Some Considerations Concerning Colour and Colouring." II. 8 p.m.

Estate Exchange.—Annual General Meeting of Members.—Auction Mart. 3 p.m.

TUESDAY, MARCH 25.

Institution of Civil Engineers.—(1) Further discussion on Mr. J. Price's paper on "Lough Erne Drainage," (2, time permitting) Mr. J. Robinson on "Barry Dock and Railways." 8 p.m.

Society of Arts (Applied Art Section).—Mr. W. J. Linton on "Engraving in Wood, Old and New." 8 p.m.

Sanitary Institute (Lectures for Sanitary Inspectors). Mr. A. Wynter Blyth on "Diseases of Animals in Relation to Meat Supply." 8 p.m.

Royal Historical and Archæological Association of Ireland.—Four papers will be read. 8 p.m.

WEDNESDAY, MARCH 26.

Society of Arts.—Mr. G. N. Hooper on "Carriage Building and Street Traffic in England and France." 8 p.m.

Liverpool Engineering Society.—Mr. T. L. Miller on "The Efficiency of Gas-engines." 8 p.m.

THURSDAY, MARCH 27.

Institution of Electrical Engineers.—Mr. H. N. Lawrence and Mr. A. Harries, M.D., on "Alternate or Continuous Currents in Relation to the Human Body." 8 p.m.

FRIDAY, MARCH 28.

Architectural Association.—Mr. Keith D. Young on "Hospitals." 7 30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. A. E. Young on "Deflection of Spiral Springs." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Inspectors).—Mr. A. Wynter Blyth on "Sanitary Law, General Enactments, Public Health Act, 1875, Model By-laws." 8 p.m.

SATURDAY, MARCH 29.

Architectural Association.—Visit to the new Hospital for Women, Marylebone-road. Mr. J. M. Brydon, architect, 3 p.m.

Royal Institution.—The Right Hon. Lord Rayleigh, M.A., F.R.S., on "Electricity and Magnetism." VII. 3 p.m.

Edinburgh Architectural Association.—Visit to Preston Tower, Preston Cross, and Prestonpans Church.

Miscellanea.

Edinburgh Electrical Exhibition.—The Dean of Guild Court last week passed plans for additions to the International Electrical Exhibition buildings. These consist of a sculpture gallery extending from the west end of the main buildings and leading to the picture galleries. These galleries will be six in number, each 60 ft. long by 30 ft. wide, intersected by a gallery 40 ft. wide, which will lead to the eastern annexe. This annexe will be 300 ft. long by 100 ft. wide, and will be mostly devoted to general exhibits and partly to a hall for lectures and concerts. From the west end of the annexe there will be a covered court, 40 ft. wide, carried by a bridge over the suburban railway and leading directly into the machinery department. In this way visitors who enter the main buildings by either of the principal doors may walk through the whole extent of the exhibition buildings, nearly half a mile, under cover. The construction of a Japanese village has commenced, and Swiss chalets, kiosks, &c., are to be erected in the grounds, to be appropriated as restaurants, cafés, &c.

Borough New Synagogue.—We are informed that the announcement in last week's *Builder* that the competition for the local minister's house had been awarded was unauthorised and premature, the award in the competition not having yet been made.

The Lock-out of Kentish Brick-makers. According to the *South-Eastern Gazette*, the lock-out of the Kentish brick-makers, referred to in our last, appears likely to last for an indefinite period. The clergy of Sittingbourne and district have sent an appeal to the brick-masters, urging them to reconsider their decision, and to re-open their works. The reply received was to the effect that they are unable to do this while the barge traffic between Sittingbourne and London is at a standstill owing to the strike of the barge-men. The Committee of the Brick-makers' Association have issued a manifesto, in which they express their regret that any dispute should have arisen with the barge-men, but they desire to record the fact that the quarrel was forced upon them by the Barge-men's Protection Society. The masters urge that they have to meet a new and yearly increasing competition with the machine-made bricks, which at the present time are being offered in the London market at a price for which it is impossible to make clamp-burnt bricks. The Kent and Essex brick trade is in a critical condition, and any further addition to the heavy burden it has already to bear would probably result in its destruction, while already several of the larger makers are preparing to reduce their make. The masters assert that the closing of the fields is the direct and necessary result of the arbitrary action of the Bargemen's Society. The trade to the district is being paralysed by the deadlock.

New Vestry Hall and Free Library for St. Martin's-in-the-Fields.—On Tuesday last the Prince of Wales laid the foundation-stone of the new Vestry Hall and offices for the Royal parish of St. Martin's-in-the-Fields, which is part of the city of Westminster, and also a memorial-stone of the new library and reading-room. The parish has secured a fine site at the south-east corner of the Charing-cross-road, facing the opening to Trafalgar-square, and opposite to St. Martin's Church, for both municipal buildings and library for the inhabitants. The architect of the new buildings is Mr. Robert Walker, and the builders are Messrs. John Mowlem & Co.

Free Lectures at Carpenters' Hall.—The last of this year's series of free lectures at Carpenters' Hall was delivered on Wednesday evening last by Professor W. C. Unwin, F.R.S., his subject being "The Construction of Walls." Mr. Banister Fletcher, Master of the Carpenters' Company, presided, and there was, as usual, a large attendance. At the close, the Chairman announced that these lectures would in all probability be continued next year, as the present course had been so much appreciated. We hope to give a report of Professor Unwin's lecture in our next.

"Old Cottage Architecture."—The following letter has been received by Mr. Ralph Nevill from Mr. R. R. Holmes, the librarian at Windsor Castle:—"Windsor Castle, March 18, 1890. Sir,—Your work on 'Old Cottage and Domestic Architecture in South-west Surrey' has been submitted to the Queen, who has been pleased to accept it. I am commanded to thank you for this interesting and useful addition to the Royal Library."

Classes in Architecture, University College, London.—The course of lectures in Modern Practice having been completed, the usual Examination has been held, with the result that Mr. A. L. Jacob has gained the prize,—and he and Mr. Dendy Watney will receive First-class Certificates, and Mr. H. R. Appelbee and Mr. H. Helsdon will receive Second-class Certificates.

Death of Mr. J. R. Herbert, R.A.—Mr. J. R. Herbert, Hon. Retired R.A., died on Monday last, at his residence, "The Chimes," Kilburn. He was in his 81st year.

PRICES CURRENT OF MATERIALS.

TIMBER.	£ s. d.	£ s. d.
Greenheart, B.G. ..... ton	6 15 0	7 5 0
Teak, E.I. ..... load	11 0 0	14 0 0
Sequoia, U.S. ..... foot cube	0 2 3	0 3 0
Ash, Canada ..... load	2 0 0	4 5 0
Birch ,, ...	2 0 0	5 0 0
Elm ,, ...	2 10 0	4 15 0
Fir, Dantsic, &c.	2 0 0	3 10 0
Oak ,, ...	2 10 0	4 10 0
Canada	5 10 0	6 10 0
Pine, Canada red	2 10 0	2 10 0
,, yellow	2 0 0	5 5 0
Lath, Dantsic ..... fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 10 0
Wainscot, Riga, &c. ..... log	0 0 0	0 0 0
Deals, Finland, 2nd and 1st. std. 100	8 0 0	11 0 0
,, ,, 4th and 3rd	7 0 0	7 10 0

TIMBER (*continued*).	£. s. d.	£. s. d.
Deals—Riga	7 0 0	8 10 0
St. Petersburg, 1st yellow	10 0 0	14 0 0
" 2nd "	8 0 0	10 0 0
" white	6 10 0	10 0 0
"	7 10 0	15 10 0
Swedish	8 0 0	17 0 0
White Sea	15 0 0	26 0 0
Canada, Pine, 1st	10 10 0	17 0 0
" " 2nd	7 0 0	10 0 0
" " 3rd, &c.	8 15 0	11 0 0
" Spruce, 1st	6 15 0	8 10 0
" " 3rd and 2nd	6 0 0	8 10 0
New Brunswick, &c.	6 0 0	16 0 0
Battens, all kinds		
Flooring Boards, sq., 1 in., prepared, First	0 11 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 6 0	0 7 9
Cedar, Cuba ..... foot	0 0 4	0 0 4½
Honduras, &c.	0 0 4	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average	0 0 4½	0 0 5½
Mexican, cargo average	0 0 5½	0 0 6½
Tobasco "	0 0 5½	0 0 6½
Honduras " ..... ton	4 0 0	13 0 0
Box, Turkey	15 0 0	20 0 0
Rose, Rio	14 0 0	18 0 0
Bahia ..... foot	0 0 6	0 1 3
Satin, St. Domingo	0 0 10	0 1 3
Porto Rico	0 0 4½	0 0 7
Walnut, Italian		

METALS.	£. s. d.	£. s. d.
IRON—		
Bar, Welsh, in London ..... ton	8 2 6	8 10 0
" " at works in Wales	7 15 0	8 0 0
" Staffordshire, in London	8 10 0	9 10 0
COPPER—British, cake and ingot	52 10 0	53 10 0
Best selected	54 0 0	55 0 0
Sheets, strong	62 0 0	0 0 0
Chili, bars	47 10 0	0 0 0
YELLOW METAL ..... lb.	0 0 5½	0 0 6
LEAD—Pig, Spanish ..... ton	12 7 6	0 0 0
English, com. brands	12 10 0	12 12 6
Sheet, English	14 15 0	0 0 0
Pipe	15 5 0	0 0 0
TIN—Straits	91 0 0	0 0 0
Australian	91 0 0	0 0 0
English Ingots	95 0 0	0 0 0
OILS.		
Linseed ..... ton	23 2 6	23 10 0
Cocoanut, Cochin	27 5 0	28 0 0
Cocoanut, Ceylon	25 5 0	0 0 0
Palm, Lagos	24 10 0	0 0 0
Rapeseed, English pale	33 0 0	0 0 0
" brown	31 10 0	31 15 0
Cottonseed, refined	22 0 0	22 5 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	5 10 0	6 10 0
" refined	7 0 0	12 0 0
TAR—Stockholm ..... barrel	1 6 0	0 0 0
Archangel	0 17 3	0 0 0

CONTRACTS & PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Works and Materials	Wood Green Local Bd.	C. J. Gunyon	Mar. 25th	ii.
Wood Paving	West Ham Council	Lewis Angell	do.	ii.
Roadmaking (Hornsey-road, N.)	St. Mary (Islington) Vestry	*Official*	Mar. 26th	ii.
Construction of Branch Line, Rhymney Junc	G. W. R. Co.	do.	do.	ii.
Pumps	Bournemouth Commrs.	F. W. Lacey	Mar. 31st	xi.
Iron Fencing, &c.	Beckenham Local Bd.	G. B. Carlton	do.	xii.
Improvements to Road, &c.	do.	do.	do.	xii
Brick and Concrete Sewer	Leyton Local Board	W. Dawson	April 1st	xi.
Patent Victoria Stone and Granite Kerb	do.	do.	do.	xi.
Brickwork, Masonry, &c., Steel and Iron-work (Manchester Widening)	Cheshire Lines Com.	W. G. Scott	do.	ii.
Brick Sewer	E. Barnet Valley L. B.	G. W. Brumell	do.	xii.
Painting, &c., at Infirmary, Kennington	Lambeth Guardians	*Official*	April 2nd	xi.
Roadmaking Works	Ealing Local Board	C. Jones	April 3rd	xi.
Supply of Flints	West Sussex County Council	C. Adcock	do.	ii.
Superstructure of New P.O., St. Martin's-le-Grand	Com. of H.M. Works	*Official*	do.	ii.
Granite Pitching	Swansea Harb. Trustees	A. J. Schenk	April 8th	ii.
Lock-up, &c., Bishop Stortford	County of Hertford	Urban A. Smith	do.	ii.
Well Sinking	Gainsborough L. B.	D. G. Macdonald	April 9th	ii.
Erection of Schools, &c.	Wivenhoe School Board	J. W. Start	April 10th	ii.
Fire Engine Station	Wimbledon Local Board	*Official*	April 14th	xii.
Paving Market Square	Aylesbury Local Board	G. Cannon	do.	xii.
Outfall Sewers	West Ham Council	Lewis Angell	April 15th	xii.
Chairs and Benches	Royal Military Exhibtn		Not stated.	ii.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Clerk of Works	Salford Corporation	4*l.* per week	Mar. 25th	xvi.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ADDISCOMBE.—For residence for Mr. A. Jepps. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C. :—

Smith & Sons	£1,330 0 0
Marriage	1,035 0 0
Taylor	999 0 0
Watson	890 0 0
Warman	785 0 0
Jones	748 0 0
Wheeler (accepted)	700 0 0

BIRMINGHAM.—For the erection of a pair of semi-detached houses at Wylde-green, Birmingham, for Mr. T. Sadler. Messrs. Titley & Jones, architects, 18, Bennett's-hill, Birmingham :—

Joseph Simons,* Birmingham	£1,520 0 0

* Accepted.

BRISTOL.—For the supply and erection of steel stanchions, girders, roofing, and constructional work, inclusive of grain-shoots, &c., at Counterslip Granaries, Warehouse E. Quantities by Mr. P. P. Hore :—

William Lindsay & Co., Queen Anne's-gate, S.W. (accepted)	£5,640 0 0

BROMLEY (Kent).—For alterations and decorations to "Coniston" Bromley, Kent. Mr. E. T. Perrott, architect, Sutton :—

Woodward & Co., Finsbury	£400 0 0
Arthur & Co., Penge	365 0 0
Armand & Son, Bromley	342 0 0
Mid-Kent Building Co., Beckenham*	249 0 0

* Accepted.

CHESHAM.—For new shop front, additions, and alterations to premises, High-street, Chesham, for Mr. Jos. Webb. Mr. Geo. H. Green, architect, Chesham, for Mr. Geo. Darlington, Amersham :—

Abbott & Son, Chesham	£556 0 0
M. A. Mead, Chesham (accepted)	560 0 0
	540 0 0

CANNOCK.—For the extension of the Union Workhouse to accommodate 98 children. Mr. J. R. Veall, Wolverhampton, architect :—

R. Barton, Hednesford	£2,900 0 0
H. Lovatt, Wolverhampton	2,635 0 0
S. Wootton, Bloxwich	2,544 0 0
A. F. Whittome, Stafford	2,505 0 0
Guest & Son, Brettel Lane	2,462 0 0
J. Reynolds, Cannock	2,412 0 0
Jones & Son, Ettingshall Road	2,360 0 0
H. Willcock, Wolverhampton	2,347 0 0
Bradney & Co., Wolverhampton	2,308 0 0
T. Mason, Hednesford	2,298 0 0
H. Gough, Wolverhampton	2,278 0 0
Dorse & Son, Cradley Heath*	2,131 0 0

* Accepted.

CROYDON.—For the erection of a detached villa residence in Spenser-road, Camden-road, South Croydon. Mr. D. E. Dale, architect, 8, Union-court, Old Broad-street :—

Dewdney (accepted)	£1,300 0 0

HASTINGS.—For the erection of unclimbable wrought-iron fence, at the site of the new workhouse, Elphinstone-road, Hastings. Mr. Philip H. Tree, architect, 59, London-road, Hastings :—

Worrall & Co., Liverpool	£1,387 0 0
J. Vinall, St. Leonards	1,256 0 0
J. Harrison, Brighton	1,218 0 0
Holme & King, London	1,203 0 0
P. Jenkins, St. Leonards	1,178 0 0
Keay & Co., Birmingham	1,146 0 0
Liddiard & Wordley, Hastings	1,127 0 0
Rowell & Co., London	1,115 0 0
Johnson & Co., Walsall	1,115 0 0
Dulcken & Co., London	1,100 0 0
T. Salter, St. Leonards	1,097 0 0
A. Snow, Hastings	1,088 0 0
J. Chappell, London	1,087 0 0
Taylor Bros., Hastings	1,039 0 0
E. Gutsell, St. Leonards	1,021 0 0
F. J. Cruttenden, St. Leonards	982 0 0
Eldridge & Cruttenden, St. Leonards (accepted)	955 0 0

EALING.—For alterations and additions to Falkirk House, Grange-road, Ealing, for Mr. B. Shepheard. Mr. G. Ashby Lean, architect and surveyor, 41, Broadway, Ealing, W. :—

B. Myring, Ealing	£1,420 0 0
T. Nye, Ealing	1,385 0 0
Adamson & Sons*	1,373 0 0

* Accepted with variations.

HARROW.—For the erection of a villa residence at Greenhill, for Mr. W. J. Hill. Mr. F. N. Cowell, Surveyor, Harrow :—

Gullett Bros. (accepted)	£580 8 0

HASTINGS.—For erecting the new Wesleyan Chapel at Hastings. Mr. E. Hoole, architect, 16, Finsbury-circus, E.C. Quantities by Messrs. Carderoy & Selby :—

Thomas Taylor	£4,724 0 0
Small	4,247 0 0
Taylor Bros.	4,234 0 0
Lathey	4,140 0 0
Ingram	4,035 0 0
Longley	3,970 0 0
Hale	3,950 0 0
Warman	3,887 0 0
Holloway	3,800 0 0
Thorpe	3,690 0 0
Cruttenden	3,587 0 0
Lester	3,417 0 0
Rollason	3,413 0 0
Womersley	3,400 0 0
Snow	3,292 0 0

HASTINGS.—For formation of roads and surface-water drainage, at the site of the new workhouse, Elphinstone-road, Hastings. Mr. Philip H. Tree, architect, 59, London-road, St. Leonards-on-Sea :—

Holme & King, London	£1,329 0 0
J. Chappell, London	1,479 0 0
A. Snow, Hastings	1,155 0 0
Eldridge & Cruttenden, St. Leonards	1,055 0 0
E. Gutsell, St. Leonards	1,052 0 0
P. Jenkins, St. Leonards	996 0 0
T. Salter, St. Leonards	965 0 0
J. Harrison, Brighton	953 0 0
A. King, St. Leonards	950 0 0
J. Piper, Hastings	948 0 0
F. J. Cruttenden, St. Leonards*	894 0 0

* Accepted.

LONDON.—For the erection of a house in the Leigham Court-road, Streatham, for Mr. F. Syer. Mr. T. H. Smith, architect, 17 and 18, Basinghall-street, E.C. Quantities by Mr. B. J. Thompson :—

J. W. Falkner	£2,233 0 0
Peacock Bros.	2,170 0 0
J. & W. Higgs	2,000 0 0
Palmer	1,998 0 0
C. F. Kearley	1,950 0 0
Holliday & Greenwood	1,943 0 0
Turtle & Appleton	1,874 0 0
F. Tarrant	1,865 0 0
Allen & Sons*	1,850 0 0

* Accepted, subject to modifications.

LONDON.—For the erection of a new police-station in the Cavendish-road, Balham, S.W., for the Receiver for the Metropolitan Police District. Mr. John Butler, architect. Quantities by Mr. W. H. Thurgood :—

Garlick & Horton	£3,456 0 0
Higgs & Hill	3,170 0 0
Dove Bros.	3,160 0 0
J. T. Chappell	3,087 0 0
Hart Bros.	3,076 0 0
Patman & Fotheringham	3,065 0 0
Grover & Son	3,040 0 0
R. Perkins	3,017 0 0
Aviss & Co.	2,990 0 0
Scrivener & Co.	2,975 0 0
Lathey Bros.	2,900 0 0
Lorden & Son	2,893 0 0

LONDON.—For outside painting, &c., at the North Surrey District Schools, Anerley. Mr. A. G. Hennell, architect :—

Martin & Barclay	£781 15 6
Luscombe	755 0 0
Prout	729 0 0
Pyett	680 0 0
Pledge	634 0 0
Baker	625 0 0
Burman & Sons	575 0 0
Arthur & Co.	575 0 0
Flaxman	575 0 0
Williams	563 0 0
Waddington	560 0 0
Holloway Bros. (accepted)	535 0 0
Mid-Kent Building Co., Ltd.	521 0 0
Ackermann	513 0 0
Lilly	484 7 6
Beadle	448 12 0
King Bros.	409 0 0
Akers	397 0 0

LONDON.—For painting and sanitary works to Nos. 7 and 8, Talbot-villas, Leyland-road, Blackheath, under the superintendence of Messrs. Dyer, Son, & Hilton, surveyors, Wallbrook, E.C. :—

Crew & Ditcham	£420 0 0
Jerrard	393 10 0
Blow	390 0 0
Havell	374 10 0

LONDON.—For repairs and decorations at the "Amherst Arms," Amherst-road, Hackney, for Messrs. Watney & Co., Stag Brewery, Pimlico. Mr. J. G. Enor, architect & Surveyor :—

Spencer & Co.	£165 0 0
Anley	163 0 0
Bramley	153 0 0
Eddie (accepted)	126 10 0
Stevens	108 0 0

LONDON.—For pulling-down and rebuilding front of No. 22, Bishopsgate-street, E.C., for Mr. A. Wagstaff. Mr. D. R. Dale, architect, 8, Union-court, Old Broad-street, E.C. :—

Drew & Cadman	£530 0 0
Wontner Smith	489 0 0
Hoare & Son	427 0 0
Joselyne & Young (accepted)	410 0 0

LONDON.—For external painting and repairs to be done at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, London, S.E. Mr. W. F. Potter, architect. Quantities prepared by Mr. C. R. Griffiths, Bank-chambers, Tooley-street, London Bridge, S.E. :—

W. Wythe, Dalston	£959 0 0
Spencer & Co., Lambeth	890 0 0
Walker Brothers, Poplar	827 0 0
B. Cook, Stonecutter-street	660 0 0
R. J. Amos, Deptford	585 0 0
W. Wells, Paddington	525 0 0
S. Hayworth & Sons, Kingsland (accepted)	445 0 0

LONDON.—For alterations and additions to the "Surrey Canal Tavern," Trafalgar-road, Peckham, S.E., for Mr. J. M. Jones. Mr. J. Jones, jun., architect :—

Gregory	£937 0 0
Pryor	860 0 0
Bright & Co.	850 0 0
Johnson	829 0 0
Holloway	773 0 0
A. & W. Garmar, Peckham*	520 0 0

* Accepted subject to alterations.

LONDON.—For fitting up offices of mineral water factory at Horse Shoe-alley, Bankside, for Roberts's Capsule Stopper Company, Limited :—

Money Marsland, Wandsworth*	£643 0 0

* Accepted.

LONDON.—For fitting up offices, &c., at 58, Southwark-street, for Messrs. Ross, Allardyce, & Co. :—

Money Marsland, Wandsworth*	£157 0 0

* Accepted.

LONDON.—For repairs and alterations to eight houses in Bermondsey. Mr. Richard Peters, architect, Wool Exchange, Coleman-street, E.C. :—

Watson	£180 0 0

LONDON.—For completion of five houses, Percy-road, Shepherd's Bush. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street :—

Sture	£120 0 0
Bishop Bros.	95 0 0
Smith	79 0 0
Serff Horle & Co. (accepted)	75 0 0

LONDON.—For the erection of two fire-escape stairs at the infirmary wing of the St. Pancras Workhouse, for the Guardians of St. Pancras. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied :—

W. Whitford & Co.	£1,295 0 0
Marshall & Hatch	950 0 0
Kirk & Randall	896 0 0
St. Pancras Iron Works Co.*	815 0 0

* Accepted.

LONDON.—For pine ingle-nook, chimney-pieces, and panelling for hall and dining-room, at Palace-court, W., for Mr. Chas. O. Tagart. Mr. J. Armstrong Stenhouse, architect :—

C. Hindley & Sons (accepted)	£145 0 0

LONDON. — For alterations and enlargement of drawing-room erection at No. 1, Landseer-road, Holloway, for Mrs. Sallman. Mr. James Norris, architect, 80, Vauxhall Bridge-road, Westminster :—

F. A. Anear & Son, 1, Wood-street, Westminster	£119 0 0

[No competition.]

NEWMARKET.—For enlarging the girls' and infants' schools for the parish of Newmarket St. Mary's. Messrs. Holland & Son, architects, Newmarket. No quantities supplied :—

H. J. Linzell	£597 0 0
J. Cowell	565 0 0
Blyth & Hunt	510 0 0
H. Plummer	509 0 0
Simpson & Son	495 0 0
Kent & Holland (accepted)	490 0 0

WEST COWES.—For scavenging the Local Board District. Mr. N. F. Dennis, C.E., Town Surveyor :—

F. Cotter	£630 0 0
John Drudge	600 0 0
R. G. Cole	587 0 0
Chas. Harvey & Son	585 0 0
H. Hales	576 0 0
John Meader	570 0 0
J. Humber	540 0 0
W. Pritchett	540 0 0
John Attrill (accepted)	500 0 0

WEST COWES.—For the paving, &c., of Beckford-road, for the Local Board. Mr. N. F. Dennis, C.E., Town Surveyor :—

	Masons' Work.	Tar Paving.
J. Meader	£81 19 0	£194 11 3
W. Coker	144 17 4	109 10 0
W. G. Thomas	84 14 7	116 0 6
Bensted & Son	—	107 9 10
Hobman & Co.	—	102 7 6
Tarrant & Harvey*	69 10 5	105 15 9

Accepted.

WEST COWES.—For the reconstruction of the west side and strengthening the south side of No. 2 Reservoir, for the Local Board. Mr. N. F. Dennis, C.E., Town Surveyor :—

E. Tarrant, West Cowes	£1,065 0 0
W. Hill & Co., Portsmouth	1,025 0 0
John Meader, West Cowes	1,020 0 0
W. G. Thomas, West Cowes*	984 0 0
Thos. Jenkings, Newport	947 0 0
Jas Pickthall, Lecklade	947 0 0

* Accepted.

[Surveyor's estimate, £1,088.]

YORKSHIRE.—For pine ingle-nook, chimney-pieces for billiard-room, &c., at Winstanley Hall, for Mr. Bankes. Mr. W. Swinden Barber, architect :—

C. Hindley & Sons (accepted)	£130 0 0

Rebuilding of the Olympic Theatre.—Messrs. Holliday & Greenwood write to say that the list of tenders for this job, printed in our last, was not published by their sanction.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 12s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by *Friday Morning's post.*

TO CORRESPONDENTS.

L. C.—"Anxious" (the article you refer to is merely the report of proceedings, involving no expression of opinion on our part. We cannot advise you, because it all depends on your own proficiency at present, of which we know nothing).—H. McL. (too late).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

WORK.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor

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Oak Wood Tapestry Dadoes, from 1s. per foot super.
Walnut or Mahogany, from 1s. 3d. per foot super.
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